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MASKED-DANCE AND WEDDING-FEAST OF TUCÚNA INDIANS.

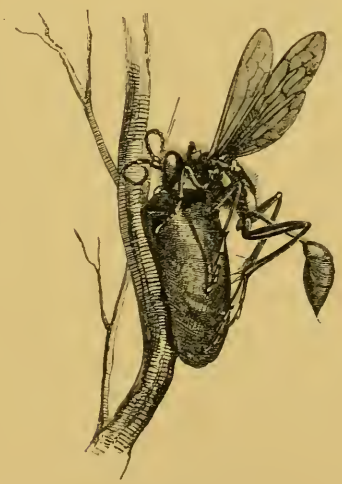
Frontispiece to Vol. II.

THE

# NATURALIST ON THE RIVER AMAZONS,

A RECORD OF ADVENTURES, HABITS OF ANIMALS, SKETCHES OF BRAZILIAN AND INDIAN LIFE, AND ASPECTS OF NATURE UNDER THE EQUATOR, DURING ELEVEN YEARS OF TRAVEL.

By HENRY WALTER BATES.



Pelopæus Wasp building nest.

IN TWO VOLUMES.—VOL. II.

LONDON:
JOHN MURRAY, ALBEMARLE STREET.
1863.

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THE

# NATURALIST ON THE AMAZONS.

## CHAPTER I.

### SANTAREM.

Situation of Santarem—Manners and customs of the inhabitants—Trade—Climate—Leprosy—Historical sketch—Grassy campos and woods—Excursions to Mapirí, Mahicá, and Irurá, with sketches of their Natural History ; Palms, wild fruit-trees, Mining Wasps, Mason Wasps, Bees, Sloths, and Marmoset Monkeys—Natural History of Termites or White Ants.

I HAVE already given a short account of the size, situation, and general appearance of Santarem. Although containing not more than 2500 inhabitants, it is the most civilised and important settlement on the banks of the main river from Peru to the Atlantic. The pretty little town, or city as it is called, with its rows of tolerably uniform, white-washed and red-tiled houses surrounded by green gardens and woods, stands on gently sloping ground on the eastern side of the Tapajos, close to its point of junction with the Amazons. A small eminence on which a fort has been erected, but which is now in a dilapidated condition, overlooks the streets, and forms the eastern limit of the mouth of the

tributary. The Tapajos at Santarem is contracted to a breadth of about a mile-and-a-half by an accretion of low alluvial land, which forms a kind of delta on the western side; fifteen miles further up the river is seen at its full width of ten or a dozen miles, and the magnificent hilly country through which it flows from the south, is then visible on both shores. This high land, which appears to be a continuation of the central table-lands of Brazil, stretches almost without interruption on the eastern side of the river down to its mouth at Santarem. The scenery as well as the soil, vegetation and animal tenants of this region, are widely different from those of the flat and uniform country which borders the Amazons along most part of its course. After travelling week after week on the main river, the aspect of Santarem with its broad white sandy beach, limpid dark-green waters, and line of picturesque hills rising behind over the fringe of green forest, affords an agreeable surprise. On the main Amazons, the prospect is monotonous unless the vessel runs near the shore, when the wonderful diversity and beauty of the vegetation afford constant entertainment. Otherwise, the unvaried, broad yellow stream, and the long low line of forest, which dwindles away in a broken line of trees on the sea-like horizon and is renewed, reach after reach, as the voyager advances; weary by their uniformity.

I arrived at Santarem on my second journey into the interior, in November, 1851, and made it my head quarters for a period, as it turned out, of three years and a half. During this time I made, in pursuance of the plan I had framed, many excursions up the Tapajos, and to

other places of interest in the surrounding region. On landing, I found no difficulty in hiring a suitable house on the outskirts of the place. It was pleasantly situated near the beach, going towards the aldeia or Indian part of the town. The ground sloped from the back premises down to the waterside, and my little raised verandah overlooked a beautiful flower-garden, a great rarity in this country, which belonged to the neighbours. The house contained only three rooms, one with brick and two with boarded floors. It was substantially built, like all the better sort of houses in Santarem, and had a stuccoed front. The kitchen, as is usual, formed an out-house placed a few yards distant from the other rooms. The rent was 12,000 reis, or about twenty-seven shillings a month. In this country, a tenant has no extra payments to make; the owners of house property pay a dizimo or tithe, to the "collectoria geral," or general treasury, but with this the occupier of course has nothing to do. In engaging servants, I had the good fortune to meet with a free mulatto, an industrious and trustworthy young fellow, named José, willing to arrange with me; the people of his family cooking for us, whilst he assisted me in collecting; he proved of the greatest service in the different excursions we subsequently made. Servants of any kind were almost impossible to be obtained at Santarem, free people being too proud to hire themselves, and slaves too few and valuable to their masters, to be let out to others. These matters arranged, the house put in order, and a rude table, with a few chairs, bought or borrowed to furnish the house with, I was ready in three or four

days to commence my Natural History explorations in the neighbourhood.

I found Santarem quite a different sort of place from the other settlements on the Amazons. At Cametá, the lively, good-humoured, and plain-living Mamelucos formed the bulk of the population, the white immigrants there, as on the Rio Negro and Upper Amazons, seeming to have fraternised well with the aborigines. In the neighbourhood of Santarem the Indians, I believe, were originally hostile to the Portuguese ; at any rate, the blending of the two races has not been here on a large scale. I did not find the inhabitants the pleasant, easy-going, and blunt-spoken country folk that are met with in other small towns of the interior. The whites, Portuguese and Brazilians, are a relatively more numerous class here than in other settlements, and make great pretensions to civilisation ; they are the merchants and shopkeepers of the place ; owners of slaves, cattle estates, and cacao plantations. Amongst the principal residents must also be mentioned the civil and military authorities, who are generally well-bred and intelligent people from other provinces. Few Indians live in the place ; it is too civilised for them, and the lower class is made up (besides the few slaves) of half-breeds, in whose composition negro blood predominates. Coloured people also exercise the different handicrafts ; the town supports two goldsmiths, who are mulattoes and have each several apprentices ; the blacksmiths are chiefly Indians, as is the case generally throughout the province. The manners of the upper class (copied from those of Pará), are

very stiff and formal, and the absence of the hearty hospitality met with in other places, produces a disagreeable impression at first. Much ceremony is observed in the intercourse of the principal people with each other, and with strangers. The best room in each house is set apart for receptions, and visitors are expected to present themselves in black dress coats, regardless of the furious heat which rages in the sandy streets of Santarem towards mid-day, the hour when visits are generally made. In the room a cane-bottomed sofa and chairs, all lacquered and gilded, are arranged in quadrangular form, and here the visitors are invited to seat themselves, whilst the compliments are passed, or the business arranged. In taking leave, the host backs out his guests with repeated bows, finishing at the front door. Smoking is not in vogue amongst this class, but snuff-taking is largely indulged in, and great luxury is displayed in gold and silver snuff-boxes. All the gentlemen, and indeed most of the ladies also, wear gold watches and guard chains. Social parties are not very frequent; the principal men being fully occupied with their business and families, and the rest spending their leisure in billiard and gambling rooms, leaving wives and daughters shut up at home. Occasionally, however, one of the principal citizens gives a ball. In the first that I attended, the gentlemen were seated all the evening on one side of the room, and the ladies on the other, and partners were allotted by means of numbered cards, distributed by a master of the ceremonies. But the customs changed rapidly in these matters after steamers began to run on the Amazons (in 1853), bring-

ing a flood of new ideas and fashions into the country. The old, bigoted, Portuguese system of treating women, which stifled social intercourse and wrought endless evils in the private life of the Brazilians, is now being gradually, although slowly, abandoned.

When a stranger arrives at an interior town in Brazil, with the intention of making some stay, he is obliged within three days to present himself at the Police office, to show his passport. He is then expected to call on the different magistrates, the military commander, and the principal private residents. This done, he has to remain at home a day or two to receive return visits, after which he is considered to be admitted into the best society. Santarem being the head of a comarca or county, as well as a borough, has a resident high judge (Juiz de Direito), besides a municipal judge (Juiz Municipal) and recorder (Promotor publico). The head of the police is also a magistrate, having jurisdiction in minor cases; he is called the delegado or delegate of police, from being appointed by and subordinate to the chief of police in the capital: all these officers are nominated by the Central Government. In a pretentious place like Santarem, the people attach great importance to these matters, and I had to go a round of visiting before I finally settled down to work. Notwithstanding the ceremonious manners of the principal inhabitants, I found several most worthy and agreeable people amongst them. Some of the older families, who spend most of their time on their plantations or cattle estates, were as kind-hearted and simple in their ways as the Obydos townsfolk. But these are rarely in town, coming only for

a few days during the festivals. They have, however, spacious town-houses, some of them two stories high, with massive walls of stone or adobe. The principal citizen, Senhor Miguel Pinto de Guimaraens, is a native of the place, and is an example of the readiness with which talent and industry meet with their reward under the wise government of Brazil. He began life in a very humble way; I was told he was once a fisherman, and retailed the produce of his hook and line or nets in the port. He is now the chief merchant of the district; a large cattle and landed proprietor; and owner of a sugar estate and mills. When the new National Guard was formed in Brazil in 1853, he received from the Emperor the commission of colonel. He is a pale, grave, and white-haired, though only middle-aged, man. I saw a good deal of him, and liked his sincerity and the uprightness of his dealings. When I arrived in Santarem he was the delegado of police. He is rather unmerciful both in and out of office towards the shortcomings, in private and public morality, of his fellow-countrymen; but he is very much respected. The nation cannot be a despicable one, whose best men are thus able to work themselves up to positions of trust and influence.

The religious festivals were not so numerous here as in other towns, and such as did take place were very poor and ill attended. There is a handsome church, but the vicar showed remarkably little zeal for religion, except for a few days now and then when the Bishop came from Pará, on his rounds through the diocese. The people are as fond of holiday making

here as in other parts of the province; but it seemed to be a growing fashion to substitute rational amusements for the processions and mummeries of the saints' days. The young folks are very musical, the principal instruments in use being the flute, violin, Spanish guitar, and a small four-stringed viola, called cavaquinho. During the early part of my stay at Santarem, a little party of instrumentalists, led by a tall, thin, ragged mulatto, who was quite an enthusiast in his art, used frequently to serenade their friends in the cool and brilliant moonlit evenings of the dry season, playing French and Italian marches and dance music with very good effect. The guitar was the favourite instrument with both sexes, as at Pará; the piano, however, is now fast superseding it. The ballads sung to the accompaniment of the guitar were not learnt from written or printed music, but communicated orally from one friend to another. They were never spoken of as songs, but *modinhas*, or "little fashions," each of which had its day, giving way to the next favourite brought by some young fellow from the capital. At festival times there was a great deal of masquerading, in which all the people, old and young, white, negro, and Indian, took great delight. The best things of this kind used to come off during the Carnival, in Easter week, and on St. John's eve; the negroes having a grand semi-dramatic display in the streets at Christmas time. The more select affairs were got up by the young whites, and coloured men associating with whites. A party of thirty or forty of these used to dress themselves in uniform style, and in very good taste, as cavaliers and dames, each

disguised with a peculiar kind of light gauze mask. The troop, with a party of musicians, went the round of their friends' houses in the evening, and treated the large and gaily-dressed companies which were there assembled to a variety of dances. The principal citizens, in the large rooms of whose houses these entertainments were given, seemed quite to enjoy them ; great preparations were made at each place ; and, after the dance, guests and masqueraders were regaled with pale ale and sweetmeats. Once a year the Indians, with whom masked dances and acting are indigenous, had their turn, and on one occasion they gave us a great treat. They assembled from different parts of the neighbourhood at night, on the outskirts of the town, and then marched through the streets by torchlight towards the quarter inhabited by the whites, to perform their hunting and devil dances before the doors of the principal inhabitants. There were about a hundred men, women, and children in the procession. Many of the men were dressed in the magnificent feather crowns, tunics, and belts, manufactured by the Mundurucús, and worn by them on festive occasions, but the women were naked to the waist, and the children quite naked, and all were painted and smeared red with anatto. The ringleader enacted the part of the Tushaua, or chief, and carried a sceptre, richly decorated with the orange, red, and green feathers of toucans and parrots. The pajé or medicine-man came along, puffing at a long tauarí cigar, the instrument by which he professes to make his wonderful cures. Others blew harsh jarring blasts with the turé, a horn made of long and thick bamboo, with a split reed in the mouth-

piece. This is the war trumpet of many tribes of Indians, with which the sentinels of predatory hordes, mounted on a lofty tree, give the signal for attack to their comrades. Those Brazilians who are old enough to remember the times of warfare between Indians and settlers, retain a great horror of the turé, its loud harsh note heard in the dead of the night having been often the prelude to an onslaught of bloodthirsty Múras on the outlying settlements. The rest of the men in the procession carried bows and arrows, bunches of javelins, clubs, and paddles. The older children brought with them the household pets; some had monkeys or coatis on their shoulders, and others bore tortoises on their heads. The squaws carried their babies in aturás, or large baskets, slung on their backs, and secured with a broad belt of bast over their foreheads. The whole thing was accurate in its representation of Indian life, and showed more ingenuity than some people give the Brazilian red man credit for. It was got up spontaneously by the Indians, and simply to amuse the people of the place.

The entire produce in cacao, salt fish, and other articles of a very large district, passes through the hands of the Santarem merchants, and a large trade, for this country, is done with the Indians on the Tapajos in salsaparilla, balsam of copaüba, India-rubber, farinha, and other productions. I was told the average annual yield of the Tapajos in salsaparilla, was about 2000 arrobas (of 32 lbs. each). The quality of the drug found in the forests of the Tapajos, is much superior to that of the Upper Amazons, and always fetches double the price at Pará. The merchants send out young Brazilians and Portuguese

in small canoes to trade on the rivers and collect the produce, and the cargoes are shipped to the capital in large cubertas and schooners, of from twenty to eighty tons burthen. The risk and profits must be great, or capital scarce, for the rate of interest on lent money or overdue accounts is two-and-a-half to three per cent. per month ; this is the same, however, as that which rules at Pará. The shops are numerous, and well-stocked with English, French, German, and North American wares ; the retail prices of which are very little above those of the capital. There is much competition amongst the traders and shopkeepers, yet they all seem to thrive, if one may judge from external appearances; but it is said, that most of them are over head and ears in debt to rich Portuguese merchants of Pará, who act as their correspondents.

The people seem to be thoroughly alive to the advantages of education for their children. Besides the usual primary schools, one for girls, and another for boys, there is a third of a higher class, where Latin and French, amongst other accomplishments, are taught by professors, who, like the common schoolmasters, are paid by the provincial government. This is used as a preparatory school to the Lyceum and Bishop's seminary, well-endowed institutions at Pará, whither it is the ambition of traders and planters to send their sons to finish their studies. The rudiments of education only are taught in the primary schools, and it is surprising how quickly and well the little lads, both coloured and white, learn reading, writing, and arithmetic. But the simplicity of the Portuguese language, which is written

as it is pronounced, or according to unvarying rules, and the use of the decimal system of accounts, make these acquirements much easier than they are with us. Students in the superior school have to pass an examination before they can be admitted at the colleges in Pará, and the managers once did me the honour to make me one of the examiners for the year. The performances of the youths, most of whom were under fourteen years of age, were very creditable, especially in grammar; there was a quickness of apprehension displayed which would have gladdened the heart of a northern schoolmaster. The course of study followed at the colleges of Pará must be very deficient; for it is rare to meet with an educated Paraense who has the slightest knowledge of the physical sciences, or even of geography, if he has not travelled out of the province. The young men all become smart rhetoricians and lawyers; any of them is ready to plead in a law case at an hour's notice; they are also great at statistics, for the gratification of which taste there is ample field in Brazil, where every public officer has to furnish volumes of dry reports annually to the government; but they are wofully ignorant on most other subjects. I do not recollect seeing a map of any kind at Santarem. The quick-witted people have a suspicion of their deficiencies in this respect, and it is difficult to draw them out on geography; but one day a man holding an important office betrayed himself by asking me, "on what side of the river was Paris situated?" This question did not arise, as might be supposed, from a desire for accurate topographical knowledge of

the Seine, but from the idea, that all the world was a great river, and that the different places he had heard of must lie on one shore or the other. The fact of the Amazons being a limited stream, having its origin in narrow rivulets, its beginning and its ending, has never entered the heads of most of the people who have passed their whole lives on its banks.

Santarem is a pleasant place to live in, irrespective of its society. There are no insect pests, mosquito, pium, sand-fly, or motuca. The climate is glorious ; during six months of the year, from August to February, very little rain falls, and the sky is cloudless for weeks together, the fresh breezes from the sea, nearly 400 miles distant, moderating the great heat of the sun. The wind is sometimes so strong for days together, that it is difficult to make way against it in walking along the streets, and it enters the open windows and doors of houses, scattering loose clothing and papers in all directions. The place is considered healthy ; but at the changes of season, severe colds and ophthalmia are prevalent. I found three Englishmen living here, who had resided many years in the town or its neighbourhood, and who still retained their florid complexions ; the plump and fresh appearance of many of the middle-aged Santarem ladies, also bore testimony to the healthfulness of the climate. The streets are always clean and dry, even in the height of the wet season ; good order is always kept, and the place pretty well supplied with provisions. None but those who have suffered from the difficulty of obtaining the necessaries of life at any price in most of the interior settlements of South

America, can appreciate the advantages of Santarem in this respect. Everything, however, except meat, was dear, and becoming every year more so. Sugar, coffee, and rice, which ought to be produced in surplus in the neighbourhood, are imported from other provinces, and are high in price ; sugar indeed, is a little dearer here than in England. There were two or three butchers' shops, where excellent beef could he had daily at twopence or twopence-halfpenny per pound. The cattle have not to be brought from a long distance as at Pará, being bred on the campos, which border the Lago Grande, only one or two days' journey from the town. Fresh fish could be bought in the port on most evenings, but, as the supply did not equal the demand, there was always a race amongst purchasers to the water-side when the canoe of a fisherman hove in sight. Very good bread was hawked around the town every morning, with milk, and a great variety of fruits and vegetables. Amongst the fruits, there was a kind called atta, which I did not see in any other part of the country. It belongs to the Anonaceous order, and the tree which produces it grows apparently wild in the neighbourhood of Santarem. It is a little larger than a good-sized orange, and the rind, which encloses a mass of rich custardy pulp, is scaled like the pine-apple, but green when ripe, and encrusted on the inside with sugar. To finish this account of the advantages of Santarem, the delicious bathing in the clear waters of the Tapajos may be mentioned. There is here no fear of alligators ; when the east wind blows, a long swell rolls in on the clean sandy beach, and the bath is most exhilarating.

There is one great drawback to the merits of Santarem. This is the prevalence here of the terrible leprosy. It seems, however, confined to certain families, and I did not hear of a well-authenticated case of a European being attacked by it. I once visited many of the lepers in company of an American physician. They do not live apart; family ties are so strong, that all attempts to induce people to separate from their leprous relatives have failed; but many believe that the malady is not contagious. The disease commences with glandular swellings in different parts of the body, which are succeeded by livid patches on the skin, and at the tips of the fingers and toes. These spread, and the parts embraced by them lose their sensibility, and decay. In course of time, as the frightful atrophy extends to the internal organs, some vital part is affected, and the sufferer dies. Some of the best families in the place are tainted with leprosy; but it falls on all races alike; white, Indian, and negro. I saw some patients who had been ill of it for ten and a dozen years; they were hideously disfigured, but bore up cheerfully; in fact, a hopeful spirit, and free, generous living had been the means of retarding in them the progress of the disorder; none were ever known to be cured of it. One man tried a voyage to Europe, and was healed whilst there, but the malady broke out again on his return. I do not know whether the dry and hot soil of Santarem has anything to do with the prevalence of this disease; it is not confined to this place, many cases having occurred at Pará, and in other provinces, but it is nowhere so rife as here; the evil fame of the

settlement indeed has spread to Portugal, where Santarem is known as the "Cidade dos Lazaros," or City of Lepers.

When the Portuguese first ascended the Amazons towards the middle of the 17th century, they found the banks of the Tapajos in the neighbourhood of Santarem, peopled by a warlike tribe of Indians, called the Tapajócos. From these, the river and the settlement (Santarem in the Indian language is called Tapajós), derive their name. The Tapajos, however, amongst the Brazilian settlers in this part, is most generally known by the Portuguese name of Rio Preto, or the Black River. According to Acunna, the historian of the Teixeira expedition (in 1637-9), the Tapajócos were very numerous, one village alone having contained more than 500 families. Their weapons were poisoned darts. Notwithstanding their numbers and courage, they quickly gave way before the encroaching Portuguese settlers, who are said to have treated them with great barbarity. The name of the tribe is no longer known in the neighbourhood, but it is probable their descendants still linger on the banks of the Lower Tapajos, a traditional hatred towards the Portuguese having been preserved amongst the semi-civilised inhabitants to the present day. The fact of the Urarí poison having been in use amongst the Tapajócos is curious, inasmuch as it shows there was at that time communication between distant tribes along the course of the main Amazons. The Indians now living on the banks of the Tapajos are ignorant of the Urarí, the drug being prepared only

by tribes which live on the rivers flowing into the Upper Amazons from the north, 1200 miles distant from the Tapajos.

The city of Santarem suffered greatly during the disorders of 1835-6. According to the accounts I received, it must have been just before that time a much more flourishing place than it is now. There were many more large proprietors, rich in slaves and cattle; the produce of cacao was greater; and a much larger trade was done with the miners of Matto Grosso, who descended the Tapajos with their gold and diamonds, to exchange for salt, hardware, and other heavy European goods. An old Scotch gentleman, Captain Hislop, who had lived here for about thirty-five years, told me that Santarem was then a most delightful place to live in. Provisions were abundant and cheap; labour was easily obtained; and the greatest order, friendliness, and contentment prevailed. The political squabble amongst the whites, which began the troubles, ended, in this part of the country, in a revolt of the Indians. At the beginning of the disorders two parties were formed, one tolerant of the "Bicudos" (long-snouts), as the Portuguese were nicknamed, and supporters of the legal Brazilian Government; the other in favour of revolution, expulsion of the Portuguese, and native rule. The latter co-operated with a large body of rebels who had collected at a place on the banks of the river, not far distant; and on a certain day, according to agreement, the town was invaded by the horde of scoundrels and mistaken patriots. All the Portuguese and those who befriended them, that these infuriated

people could lay their hands on, were brutally massacred. A space filled with mounds, amongst the myrtle bushes in the woods behind Santarem, now marks the spot where these poor fellows were confusedly buried. I could give a long account of the horrors of this time as they were related to me; but I think the details would not serve any useful purpose. It must not be thought, however, that the Amazonian people are habitually a blood-thirsty race; on the contrary, the peaceableness and gentleness of character of the inhabitants of this province, in quiet times, are proverbial throughout Brazil. The rarity or absence of deeds of violence from year to year is always commented upon by the President in his annual report to the Central Government.

When the Cabanas or rebels entered the town, the friends of lawful government retired to a large block of buildings near the water-side, which they held for many days, to cover the embarcation of their families and moveables. The negro slaves generally remained faithful to their masters. Whilst the embarcation was going on many daring feats were performed, chiefly by coloured people: one brave fellow, a mameluco, named Paca, made a bold dash one day, with a few young men of the same stamp, and secured five or six of the rebel leaders, who were carried, gagged and handcuffed, on board a schooner in the port. But the legal party were greatly outnumbered and deficient in arms and ammunition, and they were obliged, soon after Paca's feat, entirely to evacuate the town; retiring to the village of Prayinha, about 150 miles down the river. Those citizens of Santarem who sympathised with the rebels were

obliged to follow soon after, as the revolt took the shape of a war between Indians and whites. The red skins, however, made an exception in favour of the few English and French residents. Captain Hislop remained in the town during its occupation by the Cabanas, and told me that he was treated very well by the Indians and rebel chiefs.

After Santarem was recaptured, about nine months subsequent to these events, by a small sea and land force sent from Rio Janeiro, aided by the townspeople who were picked up at Prayinha, it was again attacked by a large force of Indians. This affair showed the blind fearlessness and obstinacy of the Indian character in a striking manner. An attack was expected, as the rebels were known to be concealed in great numbers in the neighbouring woods; so the Commandante of the garrison (Captain Leaõ) had the whites' quarter strongly stockaded, and every man slept under arms. The Indians acted as though inspired by a diabolical fanaticism; they had no arms, except wooden spears, clubs, and bows and arrows; for their powder and lead had been exhausted long before. With these rude weapons they came through forest and campo to the storming of the now fortified town. The attack was made at sunrise; the sentinels were killed or driven in, and the swarms of red skins climbed the stockade and thronged down the principal street. They were soon met by a strong and well-armed force, well posted in houses or behind walls, and the reckless savages were shot down by hundreds. It was not until the street was encumbered by the heaps of slain that the rest turned their

backs and fled. Their numbers were estimated at 2000 men ; the remnant of the force escaped across the campos to the village of Altar do Chao, twenty miles distant, whence they scattered themselves along the shores of the Tapajos, and gave great trouble to the Brazilians for many years afterwards. Several expeditions were sent from Santarem to reduce them, a task in which the Government was aided by the friendly Mundurucús of the Upper Tapajos, a large body of whom, under the leadership of their Tushaúa Joaquim, made war on the hostile Indians on the lower parts both of the Madeira and the Tapajos, until they were nearly exterminated.

The country around Santarem is not clothed with dense and lofty forest, like the rest of the great humid river plain of the Amazons. It is a campo region ; a slightly elevated and undulating tract of land, wooded only in patches, or with single scattered trees. A good deal of the country on the borders of the Tapajos, which flows from the great campo area of Interior Brazil, is of this description. On this account I consider the eastern side of the river, towards its mouth, to be a northern prolongation of the continental land, and not a portion of the alluvial flats of the Amazons. The soil is a coarse gritty sand ; the substratum, which is visible in some places, consisting of sandstone conglomerate probably of the same formation as that which underlies the Tabatinga clay in other parts of the river valley. The surface is carpeted with slender hairy grasses, unfit for pasture, growing to a uniform height of about a

foot. The patches of wood look like copses in the middle of green meadows; they are called by the natives "ilhas de mato," or islands of jungle; the name being, no doubt, suggested by their compactness of outline, neatly demarcated in insular form from the smooth carpet of grass around them. They are composed of a great variety of trees, loaded with succulent parasites, and lashed together by woody climbers, like the forest in other parts. A narrow belt of dense wood, similar in character to these ilhas, and like them sharply limited along its borders, runs everywhere parallel and close to the river. In crossing the campo, the path from the town ascends a little for a mile or two, passing through this marginal strip of wood; the grassy land then slopes gradually to a broad valley, watered by rivulets, whose banks are clothed with lofty and luxuriant forest. Beyond this, a range of hills extends as far as the eye can reach towards the yet untrodden interior. Some of these hills are long ridges, wooded or bare; others are isolated conical peaks, rising abruptly from the valley. The highest are probably not more than a thousand feet above the level of the river. One remarkable hill, the Serra de Muruarú, about fifteen miles from Santarem, which terminates the prospect to the south, is of the same truncated pyramidal form as the range of hills near Almeyrim. Complete solitude reigns over the whole of this stretch of beautiful country. The inhabitants of Santarem know nothing of the interior, and seem to feel little curiosity concerning it. A few tracks from the town across the campo lead to some small clearings four or five miles off, belonging

to the poorer inhabitants of the place; but, excepting these, there are no roads, or signs of the proximity of a civilised settlement.

The sandy soil and scanty clothing of trees are probably the causes of the great dryness of the climate. In some years no rain falls from August to February; whilst in other parts of the Amazons plains, both above and below this middle part of the river, heavy showers are frequent throughout the dry season. I have often watched the rain-clouds in November and December, when the shrubby vegetation is parched up by the glowing sun of the preceding three months, rise as they approached the hot air over the campos, or diverge from it to discharge their contents on the low forest-clad islands of the opposite shore. The trade-wind, however, blows with great force during the dry months; the hotter the weather the stronger is the breeze, until towards the end of the season it amounts to a gale, stopping the progress of downward-bound vessels.

Some of the trees which grow singly on the campos are very curious. The caju is very abundant; indeed, some parts of the district might be called orchards of this tree, which seems to prefer sandy or gravelly soils. There appear to be several distinct species of it growing in company, to judge by the differences in the colour, flavour, and size of the fruit. This, when ripe, has the colour and figure of a codlin apple, but it has a singular appearance owing to the large kidney-shaped kernel growing outside the pulpy portion of the fruit. It ripens in January, and the poorer classes of Santarem then resort to the campos and gather immense quan-

tities, to make a drink or "wine" as it is called, which is considered a remedy in certain cutaneous disorders. The kernels are roasted and eaten. Another wild fruit-tree is the Murishí (Byrsomina), which yields an abundance of small yellow acid berries. A decoction of its bark dyes cloth a maroon colour. It is employed for this purpose chiefly by the Indians, and coarse cotton shirts tinted with it were the distinctive badges of the native party during the revolution. A very common tree in the Ilhas do Mato is the Breio branco, which secretes from the inner bark a white resin, resembling camphor in smell and appearance. The fruit is a small black berry, and the whole tree, fruit, leaf, and stem, has the same aromatic fragrance. By loosening the bark and allowing the resin to flow freely, I collected a large quantity, and found it of great service in preserving my insect collections from the attacks of ants and mites. Another tree, much rarer than the Breio branco, namely the Umirí (Humirium floribundum), growing in the same localities, distils in a similar way an oil of the most *recherché* fragrance. The yield, however, is very small. The native women esteem it highly as a scent. To obtain a supply of the precious liquid, large strips of bark are loosened and pieces of cotton left in soak underneath. By visiting the tree daily, and pressing the oil from the cotton, a small phial containing about an ounce may be filled in the course of a month. One of the most singular of the vegetable productions of the campos is the Súcu-úba tree (Plumieria phagedænica). It grows in the greatest luxuriance in the driest parts, and with its

long, glossy, dark-green leaves, fresh and succulent even in the most arid seasons, and white jasmine-like flowers, forms the greatest decoration of these solitary places. The bark, leaves, and leaf-stalks, yield a copious supply of milky sap, which the natives use very generally as plaister in local inflammations, laying the liquid on the skin with a brush, and covering the place with cotton. I have known it to work a cure in many cases; but, perhaps, the good effect is attributable to the animal heat drawn to the place by the pad of cotton. The milk flows most freely after the occasional heavy rains in the intervals between the dry and wet seasons; it then spurts out with great force from any part of the tree if hacked with a knife in passing.

The appearance of the campos changes very much according to the season. There is not that grand uniformity of aspect throughout the year which is observed in the virgin forest, and which makes a deeper impression on the naturalist the longer he remains in this country. The seasons in this part of the Amazons region are sharply contrasted, but the difference is not so great as in some tropical countries, where, during the dry monsoon, insects and reptiles æstivate, and the trees simultaneously shed their leaves. As the dry season advances (August, September), the grass on the campos withers, and the shrubby vegetation near the town becomes a mass of parched yellow stubble. The period, however, is not one of general torpidity or repose for animal or vegetable life. Birds certainly are not so numerous as in the wet season, but some kinds remain

and lay their eggs at this time—for instance, the ground doves (Chamæpelia). The trees retain their verdure throughout, and many of them flower in the dry months. Lizards do not become torpid, and insects are seen both in the larva and the perfect states, showing that the aridity of the climate has not a general influence on the development of the species. Some kinds of butterflies, especially the little hair-streaks (Theclæ), whose larvæ feed on the trees, make their appearance only when the dry season is at its height. The land molluscs of the district, are the only animals which æstivate ; they are found in clusters, Bulimi and Helices, concealed in hollow trees, the mouths of their shells closed by a film of mucus. The fine weather breaks up often with great suddenness about the beginning of February. Violent squalls from the west or the opposite direction to the trade-wind then occur. They give very little warning, and the first generally catches the people unprepared. They fall in the night, and blowing directly into the harbour, with the first gust sweep all vessels from their anchorage ; in a few minutes, a mass of canoes, large and small, including schooners of fifty tons burthen, are clashing together, pell mell, on the beach. I have reason to remember these storms, for I was once caught in one myself, whilst crossing the river in an undecked boat, about a day's journey from Santarem. They are accompanied with terrific electric explosions, the sharp claps of thunder falling almost simultaneously with the blinding flashes of lightning. Torrents of rain follow the first outbreak ; the wind then gradually abates, and the rain subsides

into a steady drizzle, which continues often for the greater part of the succeeding day. After a week or two of showery weather the aspect of the country is completely changed. The parched ground in the neighbourhood of Santarem breaks out, so to speak, in a rash of greenery ; the dusty, languishing trees gain, without having shed their old leaves, a new clothing of tender green foliage ; a wonderful variety of quick-growing leguminous plants springs up, and leafy creepers overrun the ground, the bushes, and the trunks of trees. One is reminded of the sudden advent of spring after a few warm showers in northern climates ; I was the more struck by it as nothing similar is witnessed in the virgin forests amongst which I had passed the four years previous to my stay in this part. The grass on the campos is renewed, and many of the campo trees, especially the myrtles, which grow abundantly in one portion of the district, begin to flower, attracting by the fragrance of their blossoms a great number and variety of insects, more particularly Coleoptera. Many kinds of birds ; parrots, toucans, and barbets, which live habitually in the forest, then visit the open places. A few weeks of comparatively dry weather generally intervene in March, after a month or two of rain. The heaviest rains fall in April, May, and June ; they come in a succession of showers, with sunny gleamy weather in the intervals. June and July are the months when the leafy luxuriance of the campos, and the activity of life, are at their highest. Most birds have then completed their moulting, which extends over the period from February to May. The flowering shrubs are then mostly in bloom, and number-

less kinds of Dipterous and Hymenopterous insects appear simultaneously with the flowers. This season might be considered the equivalent of summer in temperate climates, as the bursting forth of the foliage in February represents the spring; but under the equator there is not that simultaneous march in the annual life of animals and plants, which we see in high latitudes; some species, it is true, are dependent upon others in their periodical acts of life, and go hand-in-hand with them, but they are not all simultaneously and similarly affected by the physical changes of the seasons.

I will now give an account of some of my favourite collecting places in the neighbourhood of Santarem, incorporating with the description a few of the more interesting observations made on the Natural History of the localities. To the west of the town there was a pleasant path along the beach to a little bay, called Mapirí, about five miles within the mouth of the Tapajos. The road was practicable only in the dry season. The river at Santarem rises on the average about thirty feet, varying in different years about ten feet; so that in the four months, from April to July, the water comes up to the edge of the marginal belt of wood already spoken of. This Mapirí excursion was most pleasant and profitable in the months from January to March, before the rains become too continuous. The sandy beach beyond the town is very irregular; in some places forming long spits on which, when the east wind is blowing, the waves break in a line of foam; at others receding to

shape out quiet little bays and pools. On the outskirts of the town a few scattered huts of Indians and coloured people are passed, prettily situated on the margin of the white beach, with a background of glorious foliage; the cabin of the pure-blood Indian being distinguished from the mud hovels of the free negroes and mulattoes by its light construction, half of it being an open shed where the dusky tenants are seen at all hours of the day lounging in their open-meshed grass hammocks. About two miles on the road we come to a series of shallow pools, called the Laguinhos, which are connected with the river in the wet season, but separated from it by a high bank of sand topped with bushes at other times. There is a break here in the fringe of wood, and a glimpse is obtained of the grassy campo. When the waters have risen to the level of the pools this place is frequented by many kinds of wading birds. Snow-white egrets of two species stand about the margins of the water, and dusky-striped herons may be seen half hidden under the shade of the bushes. The pools are covered with a small kind of water-lily, and surrounded by a dense thicket. Amongst the birds which inhabit this spot is the rosy-breasted Troupial (Trupialis Guianensis), a bird resembling our starling in size and habits, and not unlike it in colour, with the exception of the rich rosy vest. The water at this time of the year overflows a large level tract of campo bordering the pools, and the Troupials come to feed on the larvæ of insects which then abound in the moist soil.

Beyond the Laguinhos there succeeds a tract of level beach covered with trees which form a beautiful grove.

About the month of April, when the water rises to this level, the trees are covered with blossom, and a handsome orchid, an Epidendron with large white flowers, which clothes thickly the trunks, is profusely in bloom. Several kinds of kingfisher resort to the place: four species may be seen within a small space: the largest as big as a crow, of a mottled-grey hue, and with an enormous beak; the smallest not larger than a sparrow. The large one makes its nest in clay cliffs, three or four miles distant from this place. None of the kingfishers are so brilliant in colour as our English species. The blossoms on the trees attract two or three species of humming-birds, the most conspicuous of which is a large swallow-tailed kind (Eupetomena macroura), with a brilliant livery of emerald green and steel blue. I noticed that it did not remain so long poised in the air before the flowers as the other smaller species; it perched more frequently, and sometimes darted after small insects on the wing. Emerging from the grove there is a long stretch of sandy beach; the land is high and rocky, and the belt of wood which skirts the river banks is much broader than it is elsewhere. At length, after rounding a projecting bluff, the bay of Mapirí is reached. The river view is characteristic of the Tapajos: the shores are wooded, and on the opposite side is a line of clay cliffs, with hills in the background clothed with rolling forest. A long spit of sand extends into mid-river, beyond which is an immense expanse of dark water, the further shore of the Tapajos being barely visible as a thin grey line of trees on the horizon. The transparency of air and water in the dry season when the

brisk east wind is blowing, and the sharpness of outline of hills, woods, and sandy beaches, give a great charm to this spot.

The little pools along the beach were tenanted by several species of fresh-water mollusks. The most abundant was a long turret-shaped Melania, which swarmed in them in the same way as Limnææ do in ponds at home. I found no Limnæa, nor indeed any European genus of fresh-water mollusk, in the Amazons region. After the first storms of February the coast is strewn with large apple-shells (Ampullaria). They are not inhabitants of the pools on this side of the river, but are involuntary visitors, being driven across by the wind and waves with masses of marsh plants from the low land of the opposite shore. A great many are dead shells, and more or less worn. In showery weather I seldom came this way without seeing one or more water snakes of the genus Helicops. They were generally concealed under the heaps of thick aquatic grasses cast ashore by storms; and when exposed, always made off straight for the water. They glided along with such agility that I rarely succeeded in capturing one, and on reaching the river they sought at once the bottom in the deepest parts. I believe these snakes are swept from the marshy land of the western shore with the patches of grass and the Ampullariæ just mentioned. Other reptiles and a great number of insects are blown or floated over in the same way by the violent squalls which occur in January or February. None of the species take root on the Santarem side of the river. Sometimes myriads of Coleopterous insects, belonging to

about half a dozen kinds, are blown across, and become perfect pests to the town's people for two or three nights, swarming about the lights in every chamber. They get under one's clothing, or down one's back, and pass from the oil-lamp on to the furniture, books, and papers, smearing everything they touch. The open shops facing the beach become filled with them, and customers have to make a dash in and out through the showers that fall about the large brass lamps over the counter, when they want to make a purchase. The species are certainly not indigenous to the eastern side of the river; the hosts soon disappear; those which cannot get back must perish helplessly, for the soil, vegetation, and climate of the Santarem side are ill suited to the inhabitants of the opposite shore.

The pools I have mentioned were tenanted by a considerable variety of insects.* I found also a very large number, chiefly of carnivorous land-beetles under the pebbles and rejectamenta along the edge of the water during my many rambles. I was much struck with the similarity of the Dragon-flies (whose early states are passed in the water) to those of Britain. A species of Libellula with pointed tail, which darted about over the bushes near the ponds, is very closely

* The water-beetles found in the pools belonged to seventeen genera, thirteen of which are European. Those European genera which form the greater part of the pond population in Coleoptera in northern latitudes, are quite absent in the Amazons region: these are, Haliplus, Cnemidotus, Pelobius, Noterus, Ilybius, Agabus, Colymbetes, Dyticus, and Acilius: Hydropori, also, are very rare. The most common species belong to the genera Hydracanthus, Copelatus, Cybister, Tropisternus, and Berosus, three of which are unknown in Europe.

allied to our English L. quadrimaculata. But the resemblance was greater in the small, slender-bodied and slow-flying species, the Agrions, which every lover of rural walks must have noticed in England by river sides. There was one pretty kind with a pale blue ring at the tip of the body which resembled to a remarkable degree a common British species. Although very near akin, neither this nor any of the other kinds, were perfectly identical with European ones. The strikingly peculiar dragon-flies from Tropical America which are seen in our collections are denizens of the forest, being bred in the shady brooks and creeks in their recesses, and not in the weedy ponds of open places. Some of these forest species are strange creatures with slender bodies measuring seven inches in length; their elegant lace-work wings tipped with white or yellow. They fly slowly amongst the trees, preying on small Diptera, and in their flight look like animated spindles; the wings, placed at the fore extremity of the long, horizontally-extended body, moving rapidly and creating the impression of rotary motion.

Whilst resting in the shade during the great heat of the early hours of afternoon, I used to find amusement in watching the proceedings of the sand-wasps. A small pale green kind of Bembex (Bembex ciliata), was plentiful near the bay of Mapirí. When they are at work, a number of little jets of sand are seen shooting over the surface of the sloping bank. The little miners excavate with their fore feet, which are strongly built and furnished with a fringe of stiff bristles; they work with wonderful rapidity, and the sand thrown out be-

neath their bodies issues in continuous streams. They are solitary wasps, each female working on her own account. After making a gallery two or three inches in length in a slanting direction from the surface, the owner backs out and takes a few turns round the orifice apparently to see whether it is well made, but in reality, I believe, to take note of the locality, that she may find it again. This done, the busy workwoman flies away ; but returns, after an absence varying in different cases from a few minutes to an hour or more, with a fly in her grasp, with which she re-enters her mine. On again emerging, the entrance is carefully closed with sand. During this interval she has laid an egg on the body of the fly which she had previously benumbed with her sting, and which is to serve as food for the soft, footless grub soon to be hatched from the egg. From what I could make out, the Bembex makes a fresh excavation for every egg to be deposited ; at least in two or three of the galleries which I opened there was only one fly enclosed.

I have said that the Bembex on leaving her mine took note of the locality : this seemed to be the explanation of the short delay previous to her taking flight ; on rising in the air also the insects generally flew round over the place before making straight off. Another nearly allied but much larger species, the Monedula signata, whose habits I observed on the banks of the Upper Amazons, sometimes excavates its mine solitarily on sand-banks recently laid bare in the middle of the river, and closes the orifice before going in search of prey. In these cases the insect has to make a journey

of at least half a mile to procure the kind of fly, the Motúca (Hadaüs lepidotus), with which it provisions its cell. I often noticed it to take a few turns in the air round the place before starting; on its return it made without hesitation straight for the closed mouth of the mine. I was convinced that the insects noted the bearings of their nests and the direction they took in flying from them. The proceeding in this and similar cases (I have read of something analogous having been noticed in hive bees) seems to be a mental act of the same nature as that which takes place in ourselves when recognising a locality. The senses, however, must be immeasurably more keen and the mental operation much more certain in them than it is in man; for to my eye there was absolutely no land-mark on the even surface of sand which could serve as guide, and the borders of the forest were not nearer than half a mile. The action of the wasp would be said to be instinctive; but it seems plain that the instinct is no mysterious and unintelligible agent, but a mental process in each individual, differing from the same in man only by its unerring certainty. The mind of the insect appears to be so constituted that the impression of external objects or the want felt, causes it to act with a precision which seems to us like that of a machine constructed to move in a certain given way. I have noticed in Indian boys a sense of locality almost as keen as that possessed by the sand-wasp. An old Portuguese and myself, accompanied by a young lad about ten years of age, were once lost in the forest in a most solitary place on the banks of the main river. Our case seemed hopeless,

and it did not, for some time occur to us to consult our little companion, who had been playing with his bow and arrow all the way whilst we were hunting, apparently taking no note of the route. When asked, however, he pointed out, in a moment, the right direction of our canoe. He could not explain how he knew; I believe he had noted the course we had taken almost unconsciously: the sense of locality in his case seemed instinctive.

The Monedula signata is a good friend to travellers in those parts of the Amazons which are infested with the blood-thirsty Motúca. I first noticed its habit of preying on this fly one day when we landed to make our fire and dine on the borders of the forest adjoining a sand-bank. The insect is as large as a hornet, and has a most waspish appearance. I was rather startled when one out of the flock which was hovering about us flew straight at my face: it had espied a Motúca on my neck and was thus pouncing upon it. It seizes the fly not with its mandibles but with its fore and middle feet, and carries it off tightly held to its breast. Wherever the traveller lands on the Upper Amazons in the neighbourhood of a sand-bank he is sure to be attended by one or more of these useful vermin-killers.

The bay of Mapirí was the limit of my day excursions by the river-side to the west of Santarem. A person may travel, however, on foot, as Indians frequently do, in the dry season for fifty or sixty miles along the broad clean sandy beaches of the Tapajos. The only obstacles are the rivulets, most of which are

fordable when the waters are low. To the east my rambles extended to the banks of the Mahicá inlet. This enters the Amazons about three miles below Santarem, where the clear stream of the Tapajos begins to be discoloured by the turbid waters of the main river. The broad, placid channel of the Mahicá separates the Tapajos mainland from the alluvial low lands of the great river plain. It communicates in the interior with other inlets, and the whole forms a system of inland water-paths navigable by small vessels from Santarem to the river Curuá, forty miles distant. The Mahicá has a broad margin of rich, level pasture, limited on each side by the straight, tall hedge of forest. On the Santarem side it is skirted by high wooded ridges. A landscape of this description always produced in me an impression of sadness and loneliness which the riant virgin forests that closely hedge in most of the by-waters of the Amazons never created. The pastures are destitute of flowers, and also of animal life, with the exception of a few small plain-coloured birds and solitary Caracára eagles whining from the topmost branches of dead trees on the forest borders. A few settlers have built their palm-thatched and mud-walled huts on the banks of the Mahicá, and occupy themselves chiefly in tending small herds of cattle. They seemed to be all wretchedly poor. The oxen however, though small, were sleek and fat, and the district most promising for agricultural and pastoral employments. In the wet season the waters gradually rise and cover the meadows, but there is plenty of room for the removal of the cattle to higher ground. The lazy and

ignorant people seem totally unable to profit by these advantages. The houses have no gardens or plantations near them. I was told it was useless to plant anything, because the cattle devoured the young shoots. In this country, grazing and planting are very rarely carried on together ; for the people seem to have no notion of enclosing patches of ground for cultivation. They say it is too much trouble to make enclosures. The construction of a durable fence is certainly a difficult matter, for it is only two or three kinds of tree which will serve the purpose in being free from the attacks of insects, and these are scattered far and wide through the woods.

In one place, where there was a pretty bit of pasture surrounded by woods, I found a grazier established, who supplied Santarem daily with milk. He was a strong, wiry half-breed, a man endowed with a little more energy than his neighbours, and really a hard-working fellow. The land was his own, and the dozen or so well-conditioned cows which grazed upon it. It was melancholy, however, to see the miserable way in which the man lived. His house, a mere barn, scarcely protecting its owner from the sun and rain, was not much better built or furnished than an Indian's hut. He complained that it was impossible to induce any of the needy free people to work for wages. The poor fellow led a dull, solitary life ; he had no family, and his wife had left him for some cause or other. He was up every morning by four o'clock, milked his cows with the help of a neighbour, and carried the day's yield to the town in stone bottles packed in leather

bags on horseback by sunrise. His wretched little farm produced nothing else. The house stood in the middle of the bare pasture, without garden or any sort of plantation ; a group of stately palms stood close by, to the trunks of which he secured the cows whilst milking. Butter-making is unknown in this country ; the milk, I was told, is too poor ; it is very rare indeed to see even the thinnest coating of cream on it, and the yield for each cow is very small. Our dairyman had to bring from Santarem every morning the meat, bread, and vegetables for the day's consumption. The other residents of Mahicá were not even so well off as this man. I always had to bring my own provisions when I came this way, for a perennial famine seemed to reign in the place. I could not help picturing to myself the very different aspect this fertile tract of country would wear if it were peopled by a few families of agricultural settlers from Northern Europe.

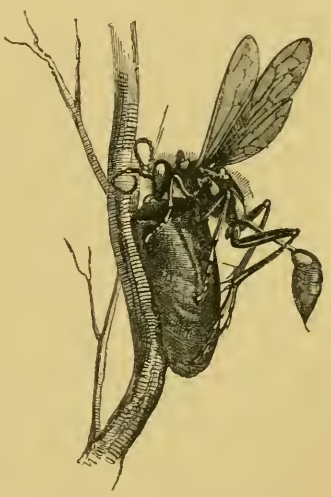
Although the meadows were unproductive ground to a Naturalist, the woods on their borders teemed with life : the number and variety of curious insects of all orders which occurred here was quite wonderful. The belt of forest was intersected by numerous pathways leading from one settler's house to another. The ground was moist, but the trees were not so lofty or their crowns so densely packed together as in other parts ; the sun's light and heat therefore had freer access to the soil, and the underwood was much more diversified than in the virgin forest. I never saw so many kinds of dwarf palms together as here ; pretty miniature species ; some not more than five feet high,

and bearing little clusters of round fruit not larger than a good bunch of currants. A few of the forest trees had the size and strongly-branched figures of our oaks, and a similar bark. One noble palm grew here in great abundance, and gave a distinctive character to the district. This was the Œnocarpus distichus, one of the kinds called Bacába by the natives. It grows to a height of forty to fifty feet. The crown is of a lustrous dark-green colour, and of a singularly flattened or compressed shape; the leaves being arranged on each side in nearly the same plane. When I first saw this tree on the campos, where the east wind blows with great force night and day for several months, I thought the shape of the crown was due to the leaves being prevented from radiating equally by the constant action of the breezes. But the plane of growth is not always in the direction of the wind, and the crown has the same shape when the tree grows in the sheltered woods. The fruit of this fine palm ripens towards the end of the year, and is much esteemed by the natives, who manufacture a pleasant drink from it similar to the assai described in a former chapter, by rubbing off the coat of pulp from the nuts, and mixing it with water. A bunch of fruit weighs thirty or forty pounds. The beverage has a milky appearance, and an agreeable nutty flavour. The tree is very difficult to climb, on account of the smoothness of its stem; consequently the natives, whenever they want a bunch of fruit for a bowl of Bacába, cut down and thus destroy a tree which has taken a score or two of years to grow, in order to get at it.

In the lower part of the Mahicá woods, towards the river, there is a bed of stiff white clay, which supplies the people of Santarem with material for the manufacture of coarse pottery and cooking utensils: all the kettles, saucepans, mandioca ovens, coffee-pots, washing-vessels, and so forth, of the poorer classes throughout the country, are made of this same plastic clay, which occurs at short intervals over the whole surface of the Amazons valley, from the neighbourhood of Pará to within the Peruvian borders, and forms part of the great Tabatinga marl deposit. To enable the vessels to stand the fire, the bark of a certain tree, called Caraipé, is burnt and mixed with the clay, which gives tenacity to the ware. Caraipé is an article of commerce, being sold, packed in baskets, at the shops in most of the towns. The shallow pits, excavated in the marly soil at Mahicá, were very attractive to many kinds of mason bees and wasps, who make use of the clay to build their nests with. I spent many an hour, watching their proceedings: a short account of the habits of some of these busy creatures may be interesting.

The most conspicuous was a large yellow and black wasp, with a remarkably long and narrow waist, the Pelopæus fistularis. It collected the clay in little round pellets, which it carried off, after rolling them into a convenient shape in its mandibles. It came straight to the pit with a loud hum, and, on alighting, lost not a moment in beginning to work; finishing the kneading of its little load in two or three minutes. The nest of this species is shaped like a pouch, two inches in length, and is attached to a branch or other

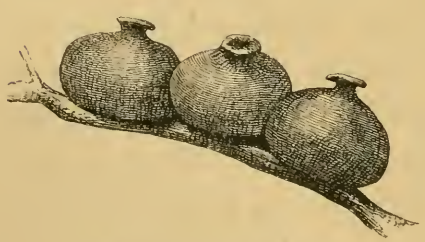
projecting object. One of these restless artificers once began to build on the handle of a chest in the cabin of my canoe, when we were stationary at a place for several days. It was so intent on its work that it allowed me to inspect the movements of its mouth with a lens whilst it was laying on the mortar. Every fresh pellet was brought in with a triumphant song, which changed to a cheerful busy hum when it alighted and began to work. The little ball of moist clay was laid on the edge of the cell, and then spread out around the circular rim by means of the lower lip guided by the mandibles. The insect placed itself astride over the rim to work, and, on finishing each addition to the structure, took a turn round, patting the sides with its feet inside and out before flying off to gather a fresh pellet. It worked only in sunny weather, and the previous layer was sometimes not quite dry when the new coating was added. The whole structure takes about a week to complete. I left the place before the gay little builder had quite finished her task : she did not accompany the canoe, although we moved along the bank of the river very slowly. On opening closed nests of this species, which are common in the neighbourhood of Mahicá, I always found them to be stocked



Pelopæus Wasp building nest.

with small spiders of the genus Gastracantha, in the usual half-dead state to which the mother wasps reduce the insects which are to serve as food for their progeny.

Besides the Pelopæus there were three or four kinds of Trypoxylon, a genus also found in Europe, and which some Naturalists have supposed to be parasitic, because the legs are not furnished with the usual row of strong bristles for digging, characteristic of the family to which it belongs. The species of Trypoxylon, however, are all building wasps; two of them which I observed (T. albitarse and an undescribed species) provision their nests with spiders, a third (T. aurifrons) with small caterpillars. Their habits are similar to those of the Pelopæus; namely, they carry off the clay in their mandibles, and have a different song when they hasten away with the burthen, to that which they sing whilst at work. Trypoxylon albitarse, which is a large black kind, three-quarters of an inch in length, makes a tremendous fuss whilst building its cell. It often chooses the walls or doors of chambers for this purpose, and when two or three are at work in the same place their loud humming keeps the house in an uproar. The cell is a tubular structure about three inches in length. T. aurifrons, a much smaller species, makes a neat little nest shaped like a carafe; building rows of them together in the corners of verandahs.



Cells of Trypoxylon aurifrons.

But the most numerous and interesting of the clay artificers are the workers of a species of social bee, the Melipona fasciculata. The Meliponæ in tropical America take the place of the true Apides, to which the European hive-bee belongs, and which are here unknown; they are generally much smaller insects than the hive-bees and have no sting. The M. fasciculata is about a third shorter than the Apis mellifica: its colonies are composed of an immense number of individuals; the workers are generally seen collecting pollen in the same way as other bees, but great numbers are employed gathering clay. The rapidity and precision of their movements whilst thus engaged are wonderful. They first scrape the clay with their man-

Melipona Bees gathering clay.

dibles; the small portions gathered are then cleared by the anterior paws and passed to the second pair of feet, which, in their turn, convey them to the large foliated expansions of the hind shanks which are adapted normally in bees, as every one knows, for the collection of pollen. The middle feet pat the growing pellets of mortar on the hind legs to keep them in a compact shape

as the particles are successively added. The little hodsmen soon have as much as they can carry, and they then fly off. I was for some time puzzled to know what the bees did with the clay; but I had afterwards plenty of opportunity for ascertaining. They construct their combs in any suitable crevice in trunks of trees or perpendicular banks, and the clay is required to build up a wall so as to close the gap, with the exception of a small orifice for their own entrance and exit. Most kinds of Meliponæ are in this way masons as well as workers in wax and pollen-gatherers. One little species (undescribed) not more than two lines long, builds a neat tubular gallery of clay, kneaded with some viscid substance outside the entrance to its hive, besides blocking up the crevice in the tree within which it is situated. The mouth of the tube is trumpet-shaped, and at the entrance a number of the pigmy bees are always stationed apparently acting as sentinels.

It is remarkable that none of the American bees have attained that high degree of architectural skill in the construction of their comb which is shown by the European hive bee. The wax cells of the Meliponæ are generally oblong, showing only an approximation to the hexagonal shape in places where several of them are built in contact. It would appear that the Old World has produced in bees, as well as in other families of animals, far more advanced forms than the tropics of the New World.

A hive of the Melipona fasciculata, which I saw opened, contained about two quarts of pleasantly-tasted liquid honey. The bees, as already remarked, have no

sting, but they bite furiously when their colonies are disturbed. The Indian who plundered the hive was completely covered by them; they took a particular fancy to the hair of his head, and fastened on it by hundreds. I found forty-five species of these bees in different parts of the country; the largest was half an inch in length; the smallest were extremely minute, some kinds being not more than one-twelfth of an inch in size. These tiny fellows are often very troublesome in the woods, on account of their familiarity; they settle on one's face and hands; and, in crawling about, get into the eyes and mouth, or up the nostrils.

The broad expansion of the hind shanks of bees is applied in some species to other uses besides the conveyance of clay and pollen. The female of the handsome golden and black Euglossa Surinamensis has this palette of very large size. This species builds its solitary nest also in crevices of walls or trees; but it closes up the chink with fragments of dried leaves and sticks cemented together, instead of clay. It visits the cajú trees, and gathers with its hind legs a small quantity of the gum which exudes from their trunks. To this it adds the other materials required from the neighbouring bushes, and when laden flies off to its nest.

Whilst on the subject of bees, I may mention that the neighbourhoods of Santarem and Villa Nova yielded me about 140 species. The genera are for the most part different from those inhabiting Europe. A very large number make their cells in hollow twigs and branches. As in our own country, the industrious nest-building kinds are attended by other species which do

not work or store up food for their progeny, but deposit their ova in the cells of their comrades. Some of these, it is well known, counterfeit the dress and general figure of their victims. To all appearance this similarity of shape and colours between the parasite and its victim is given for the purpose of deceiving the poor hard-working bee, which would otherwise revenge itself by slaying its plunderers. Some parasitic bees, however, have no resemblance to the species they impose upon; probably they live together on more friendly terms, or have some other means of disarming suspicion. Many Dipterous insects are also parasitic on bees, and wear the same dress as the species they live upon. That the dress of the victimisers is arranged with especial reference to their prey, I think is proved by what I observed at Santarem. The genera of the parasites here are not the same as in Europe; and when they counterfeit working bees, it is the peculiarly-coloured species of their own country that are imitated, and not those of any other region. The European genus Apathus, which mimics European Humble-bees, is not found in South America; but the common Bombus of Santarem, which is remarkable in being wholly of a sooty-black colour, is attended by a sooty black parasite of a widely-different genus, the Eurytis funereus. Many of the little Meliponæ have their counterfeits in small Diptera of the family Syrphidæ; and the brilliant green or blue bees of the country (Euglossa) have their imitators in parasitic bees of equally bright colours, belonging to genera unknown out of the countries where the Euglossæ are found.*

* These are Melissa, Mesocheira, Thalestria, &c.

To the south my rambles never extended further than the banks of the Irurá, a stream which rises amongst the hills already spoken of, and running through a broad valley, wooded along the margins of the water-courses, falls into the Tapajos, at the head of the bay of Mapirí. All beyond, as before remarked, is terra incognita to the inhabitants of Santarem. The Brazilian settlers on the banks of the Amazons seem to have no taste for explorations by land, and I could find no person willing to accompany me on an excursion further towards the interior. Such a journey would be exceedingly difficult in this country, even if men could be obtained willing to undertake it. Besides, there were reports of a settlement of fierce runaway negroes on the Serra de Mururarú, and it was considered unsafe to go far in that direction, except with a large armed party. I visited the banks of the Irurá and the rich woods accompanying it, and two other streams in the same neighbourhood, one called the Panéma, and the other the Urumarí, once or twice a week during the whole time of my residence in Santarem, and made large collections of their natural productions. These forest brooks, with their clear cold waters brawling over their sandy or pebbly beds through wild tropical glens, always had a great charm for me. The beauty of the moist, cool, and luxuriant glades was heightened by the contrast they afforded to the sterile country around them. The bare or scantily wooded hills which surround the valley are parched by the rays of the vertical sun. One of them, the Pico do Irurá, forms a nearly perfect cone, rising from a small grassy plain to a height

of 500 or 600 feet, and its ascent is excessively fatiguing after the long walk from Santarem over the campos. I tried it one day, but did not reach the summit. A dense growth of coarse grasses clothed the steep sides of the hill, with here and there a stunted tree of kinds found in the plain beneath. In bared places, a red crumbly soil is exposed; and in one part a mass of rock, which appeared to me, from its compact texture and the absence of stratification, to be porphyritic; but I am not Geologist sufficient to pronounce on such questions. Mr. Wallace states that he found fragments of scoriæ, and believes the hill to be a volcanic cone. To the south and east of this isolated peak, the elongated ridges or table-topped hills attain a somewhat greater elevation.

The forest in the valley is limited to a tract a few hundred yards in width on each side the different streams: in places where these run along the bases of the hills the hill-sides facing the water are also richly wooded, although their opposite declivities are bare or nearly so. The trees are lofty and of great variety; amongst them are colossal examples of the Brazil nut tree (Bertholletia excelsa), and the Pikiá. This latter bears a large eatable fruit, curious in having a hollow chamber between the pulp and the kernel, beset with hard spines which produce serious wounds if they enter the skin. The eatable part appeared to me not much more palatable than a raw potato; but the inhabitants of Santarem are very fond of it, and undertake the most toilsome journeys on foot to gather a basketful. The tree which yields the tonka bean

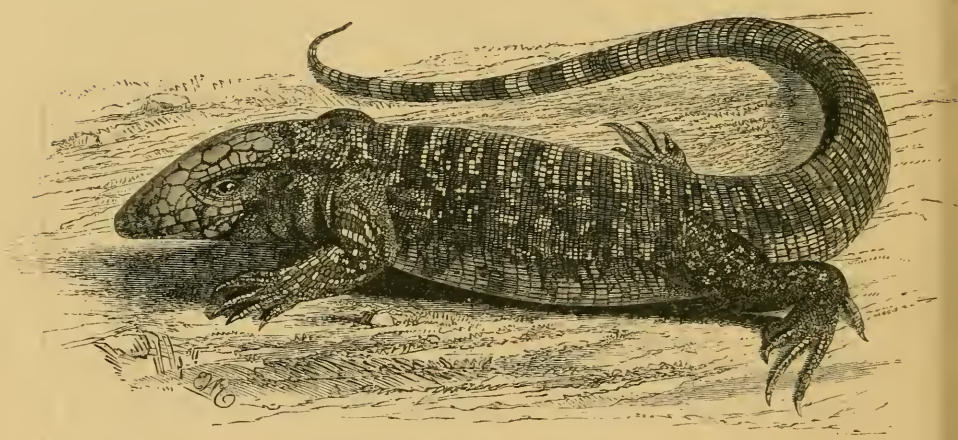
(Dipteryx odorata), used in Europe for scenting snuff, is also of frequent occurrence here. It grows to an immense height, and the fruit, which, although a legume, is of a rounded shape, and has but one seed, can be gathered only when it falls to the ground. A considerable quantity (from 1000 to 3000 pounds) is exported annually from Santarem, the produce of the whole region of the Tapajos. An endless diversity of trees and shrubs, some beautiful in flower and foliage, others bearing curious fruits, grow in this matted wilderness. It would be tedious to enumerate many of them. I was much struck with the variety of trees with large and diversely-shaped fruits growing out of the trunk and branches, some within a few inches of the ground, like the cacao. Most of them are called by the natives Cupú, and the trees are of inconsiderable height. One of them called Cupú-aï bears a fruit of elliptical shape and of a dingy earthen colour six or seven inches long, the shell of which is woody and thin, and contains a small number of seeds loosely enveloped in a juicy pulp of very pleasant flavour. The fruits hang like clayey ants'-nests from the branches. Another kind more nearly resembles the cacao; this is shaped something like the cucumber, and has a green ribbed husk. It bears the name of Cacao de macaco, or monkey's chocolate, but the seeds are smaller than those of the common cacao. I tried once or twice to make chocolate from them. They contain plenty of oil of similar fragrance to that of the ordinary cacao-nut, and make up very well into paste; but the beverage has a repulsive clayey colour and an inferior flavour.

My excursions to the Irurá had always a picnic character. A few rude huts are scattered through the valley, but they are tenanted only for a few days in the year, when their owners come to gather and roast the mandioca of their small clearings. We used generally to take with us two boys—one negro, the other Indian—to carry our provisions for the day; a few pounds of beef or fried fish, farinha and bananas, with plates, and a kettle for cooking. José carried the guns, ammunition and game-bags, and I the apparatus for entomologizing—the insect net, a large leathern bag with compartments for corked boxes, phials, glass tubes, and so forth. It was our custom to start soon after sunrise, when the walk over the campos was cool and pleasant, the sky without a cloud, and the grass wet with dew. The paths are mere faint tracks; in our early excursions it was difficult to avoid missing our way. We were once completely lost, and wandered about for several hours over the scorching soil without recovering the road. A fine view is obtained of the country from the rising ground about half way across the waste. Thence to the bottom of the valley is a long, gentle, grassy slope, bare of trees. The strangely-shaped hills; the forest at their feet, richly varied with palms; the bay of Mapirí on the right, with the dark waters of the Tapajos and its white glistening shores, are all spread out before one as if depicted on canvas. The extreme transparency of the atmosphere gives to all parts of the landscape such clearness of outline that the idea of distance is destroyed, and one fancies the whole to be almost within reach of the hand.

Descending into the valley, a small brook has to be crossed, and then half a mile of sandy plain, whose vegetation wears a peculiar aspect, owing to the predominance of a stemless palm, the Curuá (Attalea spectabilis), whose large, beautifully pinnated, rigid leaves rise directly from the soil. The fruit of this species is similar to the coco-nut, containing milk in the interior of the kernel, but it is much inferior to it in size. Here, and indeed all along the road, we saw, on most days in the wet season, tracks of the Jaguar. We never, however, met with the animal, although we sometimes heard his loud "hough" in the night whilst lying in our hammocks at home, in Santarem, and knew he must be lurking somewhere near us.

My best hunting ground was a part of the valley sheltered on one side by a steep hill whose declivity, like the swampy valley beneath, was clothed with magnificent forest. We used to make our halt in a small cleared place, tolerably free from ants and close to the water. Here we assembled after our toilsome morning's hunt in different directions through the woods, took our well-earned meal on the ground—two broad leaves of the wild banana serving us for a table-cloth—and rested for a couple of hours during the great heat of the afternoon. The diversity of animal productions was as wonderful as that of the vegetable forms in this rich locality. I find by my register that it was not unusual to meet with thirty or forty new species of conspicuous insects during a day's search, even after I had made a great number of trips to the same spot. It was pleasant to lie down during the

hottest part of the day, when my people lay asleep, and watch the movements of animals. Sometimes a troop of Anús (Crotophaga), a glossy black-plumaged bird, which lives in small societies in grassy places, would come in from the campos, one by one, calling to each other as they moved from tree to tree. Or a Toucan (Rhamphastos ariel) silently hopped or ran along and up the branches, peeping into chinks and crevices. Notes of solitary birds resounded from a



The Jacuarú (Teius teguexim).

distance through the wilderness. Occasionally a sulky Trogon would be seen, with its brilliant green back and rose-coloured breast, perched for an hour without moving on a low branch. A number of large, fat lizards two feet long, of a kind called by the natives Jacuarú (Teius teguexim) were always observed in the still hours of mid-day scampering with great clatter over the dead leaves, apparently in chase of each other. The fat of this bulky lizard is much prized by the natives, who apply

it as a poultice to draw palm spines or even grains of shot from the flesh. Other lizards of repulsive aspect, about three feet in length when full grown, splashed about and swam in the water; sometimes emerging to crawl into hollow trees on the banks of the stream, where I once found a female and a nest of eggs. The lazy flapping flight of large blue and black morpho butterflies high in the air, the hum of insects, and many inanimate sounds, contributed their share to the total impression this strange solitude produced. Heavy fruits from the crowns of trees which were mingled together at a giddy height overhead, fell now and then with a startling "plop" into the water. The breeze, not felt below, stirred in the topmost branches, setting the twisted and looped sipós in motion, which creaked and groaned in a great variety of notes. To these noises were added the monotonous ripple of the brook, which had its little cascade at every score or two yards of its course.

We frequently fell in with an old Indian woman, named Cecilia, who had a small clearing in the woods. She had the reputation of being a witch (feiticeira), and I found, on talking with her, that she prided herself on her knowledge of the black art. Her slightly curled hair showed that she was not a pure-blood Indian: I was told her father was a dark mulatto. She was always very civil to our party; showing us the best paths, explaining the virtues and uses of different plants, and so forth. I was much amused at the accounts she gave of the place. Her solitary life and the gloom of the woods seemed to have filled her with su-

perstitious fancies. She said gold was contained in the bed of the brook, and that the murmur of the water over the little cascades was the voice of the "water-mother" revealing the hidden treasure. A narrow pass between two hill sides was the portaõ or gate, and all within, along the wooded banks of the stream, was enchanted ground. The hill underneath which we were encamped was the enchanter's abode, and she gravely told us she often had long conversations with him. These myths were of her own invention, and in the same way an endless number of other similar ones have originated in the childish imaginations of the poor Indian and half-breed inhabitants of different parts of the country. It is to be remarked, however, that the Indian men all become sceptics after a little intercourse with the whites. The witchcraft of poor Cecilia was of a very weak quality. It consisted in throwing pinches of powdered bark of a certain tree and other substances into the fire whilst muttering a spell—a prayer repeated backwards—and adding the name of the person on whom she wished the incantation to operate. Some of the feiticeiras, however, play more dangerous tricks than this harmless mummery. They are acquainted with many poisonous plants, and although they seldom have the courage to administer a fatal dose, sometimes contrive to convey to their victim sufficient to cause serious illness. The motive by which they are actuated is usually jealousy of other women in love matters. Whilst I resided in Santarem a case of what was called witchcraft was tried by the sub-delegado, in which a highly respectable white lady was the com-

plainant. It appeared that some feiticeira had sprinkled a quantity of the acrid juice of a large arum on her linen as it was hanging out to dry, and it was thought this had caused a serious eruption under which the lady suffered.

I seldom met with any of the larger animals in these excursions. We never saw a mammal of any kind on the campos; but tracks of three species were seen occasionally besides those of the Jaguar: these belonged to a small tiger cat, a deer, and an opossum; all of which animals must have been very rare, and probably nocturnal in their habits, with the exception of the deer. I saw in the woods, on one occasion, a small flock of monkeys, and once had an opportunity of watching the movements of a sloth. The monkeys belonged to a very pretty and rare species, a kind of marmoset, I think the Hapale humeralifer described by Geoffroy St. Hilaire. I did not succeed in obtaining a specimen, but saw a living example afterwards in the possession of a shopkeeper at Santarem. It seems to occur nowhere else except in the dry woods bordering the campos in the interior parts of Brazil. The colours of its fur are beautifully varied; the fore part of the body is white, with the hands gray; the hind part black, with the rump and underside reddish-tawny; the tail is banded with gray and black. Its face is partly naked and flesh-coloured, and the ears are fringed with long white hairs. The specimen was not more than eight inches in length, exclusive of the tail. Altogether I thought it the prettiest species of its family I had yet seen. One would mistake it, at first sight, for a kitten, from its small size, varied

colours, and the softness of its fur. It was a most timid creature, screaming and biting when any one attempted to handle it; it became familiar, however, with the people of the house a few days after it came into their possession. When hungry or uneasy it uttered a weak querulous cry, a shrill note, which was sometimes prolonged so as to resemble the stridulation of a grasshopper. The sloth was of the kind called by Cuvier Bradypus tridactylus, which is clothed with shaggy gray hair. The natives call it, in the Tupí language, Aï ybyreté (in Portuguese, Preguiça da terra firme), or sloth of the mainland, to distinguish it from the Bradypus infuscatus, which has a long, black and tawny stripe between the shoulders, and is called Aï Ygapó (Preguiça das vargens), or sloth of the flooded lands. Some travellers in South America have described the sloth as very nimble in its native woods, and have disputed the justness of the name which has been bestowed on it. The inhabitants of the Amazons region, however, both Indians and descendants of the Portuguese, hold to the common opinion, and consider the sloth as the type of laziness. It is very common for one native to call another, in reproaching him for idleness, "bicho do Embaüba" (beast of the Cecropia tree); the leaves of the Cecropia being the food of the sloth. It is a strange sight to watch the uncouth creature, fit production of these silent shades, lazily moving from branch to branch. Every movement betrays, not indolence exactly, but extreme caution. He never looses his hold from one branch without first securing himself to the next, and when he does

not immediately find a bough to grasp with the rigid hooks into which his paws are so curiously transformed, he raises his body, supported on his hind legs, and claws around in search of a fresh foothold. After watching the animal for about half an hour I gave him a charge of shot; he fell with a terrific crash, but caught a bough, in his descent, with his powerful claws, and remained suspended. Our Indian lad tried to climb the tree, but was driven back by swarms of stinging ants; the poor little fellow slid down in a sad predicament, and plunged into the brook to free himself. Two days afterwards I found the body of the sloth on the ground: the animal having dropped on the relaxation of the muscles a few hours after death. In one of our voyages, Mr. Wallace and I saw a sloth (B. infuscatus) swimming across a river, at a place where it was probably 300 yards broad. I believe it is not generally known that this animal takes to the water. Our men caught the beast, cooked, and ate him.

In returning from these trips we were sometimes benighted on the campos. We did not care for this on moonlit nights, when there was no danger of losing the path. The great heat felt in the middle hours of the day is much mitigated by four o'clock in the afternoon; a few birds then make their appearance; small flocks of ground doves run about the stony hillocks; parrots pass over and sometimes settle in the ilhas; pretty little finches of several species, especially one kind, streaked with olive-brown and yellow, and somewhat resembling our yellow-hammer, but I believe not

belonging to the same genus, hop about the grass, enlivening the place with a few musical notes. The Carashúe (Mimus) also then resumes its mellow, blackbird-like song ; and two or three species of hummingbird, none of which however are peculiar to the district, flit about from tree to tree. On the other hand, the little blue and yellow-striped lizards, which abound amongst the herbage during the scorching heats of midday, retreat towards this hour to their hiding-places ; together with the day-flying insects and the numerous campo butterflies. Some of these latter resemble greatly our English species found in heathy places, namely, a fritillary, Argynnis (Euptoieta) Hegesia, and two smaller kinds, which are deceptively like the little Nemeobius Lucina. After sunset the air becomes delightfully cool and fragrant with fruits and flowers. The nocturnal animals then come forth. A monstrous hairy spider, five inches in expanse (Mygale Blondii), of a brown colour with yellowish lines along its stout legs — which is very common here, inhabiting broad tubular galleries smoothly lined with silken web—may be then caught on the watch at the mouth of its burrow. It is only seen at night, and I think does not wander far from its den ; the gallery is about two inches in diameter, and runs in a slanting direction, about two feet from the surface of the soil. As soon as it is night, swarms of goatsuckers suddenly make their appearance, wheeling about in a noiseless, ghostly manner, in chase of night-flying insects. They sometimes descend and settle on a low branch, or even on the pathway close to where

one is walking, and then squatting down on their heels, are difficult to distinguish from the surrounding soil. One kind (Hydropsalis psalidurus ?) has a long forked tail. In the daytime they are concealed in the wooded ilhas, where I very often saw them crouched and sleeping on the ground in the dense shade. They make no nest, but lay their eggs on the bare ground. Their breeding time is in the rainy season, and fresh eggs are found from December to June. Birds have not one uniform time for nidification here, as in temperate latitudes. Gulls and plovers lay in September, when the sand-banks are exposed in midriver in the dry season. Later in the evening, the singular notes of the goat-suckers are heard, one species crying Quao, Quao, another Chuck-co-co-cao ; and these are repeated at intervals far into the night in the most monotonous manner. A great number of toads are seen on the bare sandy path-ways soon after sunset. One of them was quite a colossus, about seven inches in length and three in height. This big fellow would never move out of the way until we were close to him. If we jerked him out of the path with a stick, he would slowly recover himself, and then turn round to have a good impudent stare. I have counted as many as thirty of these monsters within a distance of half a mile.

The surface of the campos is disfigured in all directions by earthy mounds and conical hillocks, the work of many different species of white ants. Some of these structures are five feet high, and formed of particles of earth worked into a material as hard as

stone; others are smaller, and constructed in a looser manner. The ground is everywhere streaked with the narrow covered galleries which are built up by the insects of grains of earth different in colour from the surrounding soil, to protect themselves whilst conveying materials wherewith to build their cities—for such the tumuli may be considered—or carrying their young from one hillock to another. The same covered ways are spread over all the dead timber, and about the decaying roots of herbage, which serve as food to the white ants. An examination of these tubular passages or arcades in any part of the district, or a peep into one of the tumuli, reveals always a throng of eager, busy creatures. I became very much interested in these insects while staying at Santarem, where many circumstances favoured the study of their habits, and examined several hundred colonies in endeavouring to clear up obscure points in their natural history. Very little, up to that date, had been recorded of the constitution and economy of their communities, owing doubtless to their not being found in northern and central Europe, and, therefore, not within reach of European observers. I will give a short summary of my observations, and with this we shall have done with Santarem and its neighbourhood.*

White ants are small, pale-coloured, soft-bodied insects, having scarcely anything in common with true

* My original notes on the Termites, comprising all details, were sent to Professor Westwood (Oxford) in 1854 and 1855; they were not printed in England, but have been translated into German, and published by Dr. Hagen, with his monograph of the family, in the Linnæa Entomologica, 12 Band, Stettin, 1858, p. 207, ff.

ants, except their consisting, in each species and family, of several distinct orders of individuals or castes which live together in populous, organized communities. In both there are, besides the males and females, a set of individuals of no fully-developed sex, immensely more numerous than their brothers and sisters, whose task is to work and care for the young brood. In true ants this class of the community consists of undeveloped females, and when it comprises, as is the case in many species, individuals of different structure, the functions of these do not seem to be rigidly defined. The contrary happens in the Termites, and this perhaps shows that the organization of their communities has reached a higher stage, the division of labour being more complete. The neuters in these wonderful insects are always divided into two classes—fighters and workers; both are blind, and each keeps to its own task; the one to build, make covered roads, nurse the young brood from the egg upwards, take care of the king and queen, who are the progenitors of the whole colony, and secure the exit of the males and females, when they acquire wings and fly out to pair and disseminate the race: the other to defend the community against all comers. Ants and termites are also widely different in their mode of growth, or, as it is called, metamorphosis. Ants in their early stage are footless grubs, which, before they reach the adult state, pass through an intermediate quiescent stage (pupa) inclosed in a membrane. Termites, on the contrary, have a similar form when they emerge from the egg to that which they retain throughout life; the chief dif-

ference being the gradual acquisition of eyes and wings in the sexual individuals during the later stages of growth. Termites and true ants, in fact, belong to two widely dissimilar orders of insects, and the analogy between them is only a general one of habits. The mode of growth of Termites and the active condition of their younger stages (larva and pupa) make the constitution of their communities much more difficult of comprehension than that of ants; hence how many castes existed, and what sort of individuals they were composed of, if not males and females, have always been puzzles to naturalists in the absence of direct observation.

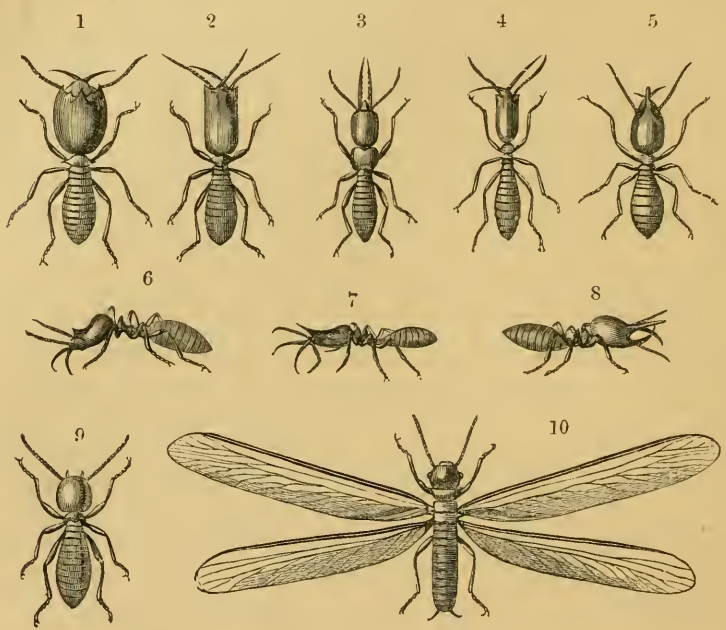
What a strange spectacle is offered to us in the organisation of these insect communities! Nothing analogous occurs amongst the higher animals. Social instincts exist in many species of mammals and birds, where numerous individuals unite to build common habitations, as we see in the case of weaver-birds and beavers; but the principle of division of labour, the setting apart of classes of individuals for certain employments, occurs only in human societies in an advanced state of civilisation. In all the higher animals there are only two orders of individuals as far as bodily structure is concerned, namely, males and females. The wonderful part in the history of the Termites is, that not only is there a rigid division of labour, but nature has given to each class a structure of body adapting it to the kind of labour it has to perform. The males and females form a class apart; they do no kind of work, but in the course of growth acquire

wings to enable them to issue forth and disseminate their kind. The workers and soldiers are wingless, and differ solely in the shape and armature of the head. This member in the labourers is smooth and rounded, the mouth being adapted for the working of the materials in building the hive ; in the soldiers the head is of very large size, and is provided in almost every kind with special organs of offence or defence in the form of horny processes resembling pikes, tridents, and so forth. Some species do not possess these extraordinary projections, but have, in compensation, greatly lengthened jaws, which are shaped in some kinds as sickles, in others as sabres and saws.

The course of human events in our day seems, unhappily, to make it more than ever necessary for the citizens of civilised and industrious communities to set apart a numerous armed class for the protection of the rest ; in this nations only do what nature has of old done for the Termites. The soldier Termes, however, has not only the fighting instinct and function ; he is constructed as a soldier, and carries his weapons not in his hand, but growing out of his body.

Whenever a colony of Termites is disturbed, the workers are at first the only members of the community seen ; these quickly disappear through the endless ramified galleries of which a Termitarium is composed, and soldiers make their appearance. The observations of Smeathman on the soldiers of a species inhabiting tropical Africa are often quoted in books on Natural History, and give a very good idea of their habits. I was always amused at the pugnacity dis-

played, when, in making a hole in the earthy cemented archway of their covered roads, a host of these little fellows mounted the breach to cover the retreat of the workers. The edges of the rupture bristled with their armed heads as the courageous warriors ranged themselves in compact line around them. They at-




1—8. Soldiers of different species of White Ants.—9. Ordinary shape of worker.—10. Winged class.

tacked fiercely any intruding object, and as fast as their front ranks were destroyed, others filled up their places. When the jaws closed in the flesh, they suffered themselves to be torn in pieces rather than loosen their hold. It might be said that this instinct is rather a cause of their ruin than a protection when a colony is attacked by the well-known enemy of Termites, the ant-bear; but it is the soldiers only

which attach themselves to the long worm-like tongue of this animal, and the workers, on whom the prosperity of the young brood immediately depends, are left for the most part unharmed. I always found, on thrusting my finger into a mixed crowd of Termites, that the soldiers only fastened upon it. Thus the fighting caste do in the end serve to protect the species by sacrificing themselves for its good.

A family of Termites consists of workers as the majority, of soldiers, and of the King and Queen. These are the constant occupants of a completed Termitarium. The royal couple are the father and mother of the colony, and are always kept together closely guarded by a detachment of workers in a large chamber in the very heart of the hive, surrounded by much stronger walls than the other cells. They are wingless and both immensely larger than the workers and soldiers. The Queen, when in her chamber, is always found in a gravid condition, her abdomen enormously distended with eggs, which, as fast as they come forth, are conveyed by a relay of workers in their mouths from the royal chamber to the minor cells dispersed throughout the hive. The other members of a Termes family are the winged individuals: these make their appearance only at a certain time of the year, generally in the beginning of the rainy season. It has puzzled naturalists to make out the relationship between the winged Termites and the wingless King and Queen. It has also generally been thought that the soldiers and workers are the larvæ of the others; an excusable mistake, seeing that they much resemble larvæ. I satisfied myself,

after studying the habits of these insects daily for several months, that the winged Termites were males and females in about equal numbers, and that some of them, after shedding their wings and pairing, became Kings and Queens of new colonies; also, that the soldiers and workers were individuals which had arrived at their full growth without passing through the same stages as their fertile brothers and sisters.

A Termitarium, although of different shape, size, texture of materials, and built in different situations, according to the species, is always composed of a vast number of chambers and irregular intercommunicating galleries, built up with particles of earth or vegetable matter, cemented together by the saliva of the insects. There is no visible mode of ingress or egress, the entrances being connected with covered roads, which are the sole means of communication with the outer world. The structures are prominent objects in all tropical countries. The very large hillocks at Santarem are the work of many distinct species, each of which uses materials differently compacted, and keeps to its own portion of the tumulus. One kind, Termes arenarius, on which these remarks are chiefly founded, makes little conical hillocks of friable structure, a foot or two in height, and is generally the sole occupier. Another kind (Termes exiguus) builds small dome-shaped papery edifices. Many species live on trees, their earthy nests, of all sizes, looking like ugly excrescences on the trunks and branches. Some are wholly subterranean, and others live under the bark, or in the interior of trees: it is these two latter

kinds which get into houses and destroy furniture, books, and clothing. All hives do not contain a queen and her partner. Some are new constructions, and, when taken to pieces, show only a large number of workers occupied in bringing eggs from an old overstocked Termitarium, with a small detachment of soldiers evidently told off for their protection.

A few weeks before the exodus of the winged males and females a completed Termitarium contains Termites of all castes and in all stages of development. On close examination I found the young of each of the four orders of individuals crowded together, and apparently feeding in the same cells. The full-grown workers showed the greatest attention to the young larvæ, carrying them in their mouths along the galleries from one cell to another, but they took no notice of the full-grown ones. It was not possible to distinguish the larvæ of the four classes when extremely young, but at an advanced stage it was easy to see which were to become males and females, and which workers and soldiers. The workers have the same form throughout, the soldiers showed in their later stages of growth the large head and cephalic processes, but much less developed than in the adult state. The males and females were distinguishable by the possession of rudimentary wings and eyes, which increased in size after three successive changes of skin.

Thus I think I made out that the soldier and worker castes are, like the males and females, distinct from the egg; they are not made so by a difference of food or treatment during their earlier stages, and they never

become winged insects. The workers and soldiers feed on decayed wood and other vegetable substances; I could not clearly ascertain what the young fed upon, but they are seen of all sizes, larvæ and pupæ, huddled together in the same cells, with their heads converging towards the bottom, and I thought I sometimes detected the workers discharging a liquid from their mouths into the cells. The growth of the young family is very rapid, and seems to be completed within the year: the greatest event of Termite life then takes place, namely, the coming of age of the winged males and females, and their exit from the hive.

It is curious to watch a Termitarium when this exodus is taking place. The workers are set in the greatest activity, as if they were aware that the very existence of their species depended on the successful emigration and marriages of their brothers and sisters. They clear the way for their bulky but fragile bodies, and bite holes through the outer walls for their escape. The exodus is not completed in one day, but continues until all the males and females have emerged from their pupa integuments, and flown away. It takes place on moist, close evenings, or on cloudy mornings: they are much attracted by the lights in houses, and fly by myriads into chambers, filling the air with a loud rustling noise, and often falling in such numbers that they extinguish the lamps. Almost as soon as they touch ground they wriggle off their wings, to aid which operation there is a special provision in the structure of the organs, a seam running across near their roots and dividing the horny nervures. To prove that this singular mutilation was

voluntary, on the part of the insects, I repeatedly tried to detach the wings by force, but could never succeed whilst they were fresh, for they always tore out by the roots. Few escape the innumerable enemies which are on the alert at these times to devour them; ants, spiders, lizards, toads, bats, and goat-suckers. The waste of life is astonishing. The few that do survive pair and become the kings and queens of new colonies. I ascertained this by finding single pairs a few days after the exodus, which I always examined and proved to be males and females, established under a leaf, a clod of earth, or wandering about under the edges of new tumuli. The females are then not gravid. I once found a newly-married pair in a fresh cell tended by a few workers.

The office of Termites in these hot countries is to hasten the decomposition of the woody and decaying parts of vegetation. In this they perform what in temperate latitudes is the task of other orders of insects. Many points in their natural history still remain obscure. We have seen that there are males and females, which grow, reach the adult winged state, and propagate their kind like all other insects. Unlike others, however, which are always, each in its sphere, provided with the means of maintaining their own in the battle of life, these are helpless creatures, which, without external aid, would soon perish, entailing the extinction of their kind. The family to which they belong is therefore provided with other members, not males or females, but individuals deprived of the sexual instincts, and so endowed in body and mind that they are adapted and impelled to

devote their lives for the good of their species. But I have not explained how these neuter individuals, soldiers and workers, come to be distinct castes. This is still a knotty point, which I could do nothing to solve. Neuter bees and ants are known to be undeveloped females. I thought it a reasonable hypothesis, on account of the total absence of intermediate individuals connecting the two forms, that worker and soldier might be in a similar way female and male whose development had been in some way arrested. A French anatomist, however, M. Lespés,* believes to have found by dissection imperfect males and females in each of the castes. The correctness of his observations is doubted by competent judges;† if his conclusion be true, the biology of Termites is indeed a mystery.

* Recherches sur l'Organization et les Mœurs du Termite Lucifuge, Annales des Sciences Naturelles, 4me serie, tome 5, fasc. 4 et 5. Paris, 1856. M. Lespés states also to have found two distinct forms of pupa in the same species, one only of which he believes to become kings and queens. I observed nothing of the kind in Termes arenarius. Dr. Hagen mentions, in his monograph, cases of beaked workers and winged soldiers. I always found the beaked individuals to be of the fighting caste; with regard to winged soldiers and other curious forms of pupæ which have occurred, they are probably either monstrosities, or belong to species having a peculiar mode of development. I did not meet with such; I found, however, a species whose soldier class did not differ at all, except in the fighting instinct, from the workers.

† Gerstaecker, Bericht über den Leistungen, &c., der Entomologie, 1856. p. 6. Hagen, Linnæa Entomologica, 1858, p. 24.

## CHAPTER II.

### VOYAGE UP THE TAPAJOS.

Preparations for voyage—First day's sail—Mode of arranging money-matters and remittance of collections in the interior—Loss of boat—Altar do Chaõ—Excursion in forest—Valuable timber—Modes of obtaining fish—Difficulties with crew—Arrival at Aveyros—Excursions in the neighbourhood—White Cebus and habits and dispositions of Cebi monkeys—Tame parrot—Missionary settlement—Enter the River Cuparí—Adventure with Anaconda—Smoke-dried monkey—Boa-constrictor—Village of Mundurucú Indians, and incursion of a wild tribe—Falls of the Cuparí—Hyacinthine macaw—Re-emerge into the broad Tapajos—Descent of river to Santarem.

*June*, 1852.—I will now proceed to relate the incidents of my principal excursion up the Tapajos, which I began to prepare for, after residing about six months at Santarem.

I was obliged, this time, to travel in a vessel of my own; partly because trading canoes large enough to accommodate a Naturalist very seldom pass between Santarem and the thinly-peopled settlements on the river, and partly because I wished to explore districts at my ease, far out of the ordinary track of traders. I soon found a suitable canoe; a two-masted cuberta, of about six tons' burthen, strongly built of Itaüba or stone-wood, a timber of which all the best vessels in the

Amazons country are constructed, and said to be more durable than teak. This I hired of a merchant at the cheap rate of 500 reis, or about one shilling and twopence per day. I fitted up the cabin, which, as usual in canoes of this class, was a square structure with its floor above the water-line, as my sleeping and working apartment. My chests, filled with store-boxes and trays for specimens, were arranged on each side, and above them were shelves and pegs to hold my little stock of useful books, guns, and game bags, boards and materials for skinning and preserving animals, botanical press and papers, drying cages for insects and birds, and so forth. A rush mat was spread on the floor, and my rolled-up hammock, to be used only when sleeping ashore, served for a pillow. The arched covering over the hold in the fore part of the vessel contained, besides a sleeping place for the crew, my heavy chests, stock of salt provisions and groceries, and an assortment of goods wherewith to pay my way amongst the half-civilised or savage inhabitants of the interior. The goods consisted of cashaça, powder and shot, a few pieces of coarse checked-cotton cloth and prints, fish-hooks, axes, large knives, harpoons, arrow-heads, looking-glasses, beads, and other small wares. José and myself were busy for many days arranging these matters. We had to salt the meat and grind a supply of coffee ourselves. Cooking utensils, crockery, water-jars, a set of useful carpenter's tools, and many other things had to be provided. We put all the groceries and other perishable articles in tin canisters and boxes, having found that this was the only way of preserving them from damp and insects in this climate.

When all was done, our canoe looked like a little floating workshop.

I could get little information about the river, except vague accounts of the difficulty of the navigation, and the famito or hunger which reigned on its banks. As I have before mentioned, it is about a thousand miles in length, and flows from south to north; in magnitude it stands the sixth amongst the tributaries of the Amazons. It is navigable, however, by sailing vessels only for about 160 miles above Santarem. The hiring of men to navigate the vessel was our greatest trouble. José was to be my helmsman, and we thought three other hands would be the fewest with which we could venture. But all our endeavours to procure these were fruitless. Santarem is worse provided with Indian canoemen than any other town on the river. I found, on applying to the tradesmen to whom I had brought letters of introduction and to the Brazilian authorities, that almost any favour would be sooner granted than the loan of hands. A stranger, however, is obliged to depend on them; for it is impossible to find an Indian or half-caste whom some one or other of the head-men do not claim as owing him money or labour. I was afraid at one time I should have been forced to abandon my project on this account. At length, after many rebuffs and disappointments, José contrived to engage one man, a mulatto, named Pinto, a native of the mining country of Interior Brazil, who knew the river well; and with these two I resolved to start, hoping to meet with others at the first village on the road.

We left Santarem on the 8th of June. The waters

were then at their highest point, and my canoe had been anchored close to the back door of our house. The morning was cool and a brisk wind blew, with which we sped rapidly past the white-washed houses and thatched Indian huts of the suburbs. The charming little bay of Mapirí was soon left behind; we then doubled Point Maria Josepha, a headland formed of high cliffs of Tabatinga clay, capped with forest. This forms the limit of the river view from Santarem, and here we had our last glimpse, at a distance of seven or eight miles, of the city, a bright line of tiny white buildings resting on the dark water. A stretch of wild rocky uninhabited coast was before us, and we were fairly within the Tapajos.

Some of my readers may be curious to know how I managed money affairs during these excursions in the interior of the South American continent: it can be explained in a few words. In the first place, I had an agent in London to whom I consigned my collections. During the greater part of the time I drew on him for what sums I wanted, and an English firm at Pará (the only one in the country which traded regularly and directly with England) cashed the drafts. I found no difficulty in the interior of the country, for almost any of the larger Portuguese or Brazilian traders, of whom there are one or two in every village of 600 or 700 inhabitants, would honour my draft on the English house; they having each a correspondent at Pará who deals with the foreign merchants. Sometimes a Portuguese trader would hint at discount, or wish me to take part of the amount in goods, but the Brazilians were

generally more liberal. At one period, when I was obliged to wait for remittances from England,* I sometimes ran short of money; but I had only to say a word to one of these generous and considerate men, and the assistance was given without interest to the extent I required. The current money on the Amazons varied much during the eleven years of my stay. At first, nothing but copper coins and Brazilian treasury notes, the smallest representing 1000 reis (2*s.* 3*d.*), were seen; afterwards (1852—1856), with the increase of the India-rubber trade, a large amount of specie was imported,—American gold coins, Spanish and Mexican dollars, and English sovereigns. These were the commonest medium of exchange in Pará and on the Lower Amazons, until India-rubber fell suddenly in price, in 1855, when the gold again quickly disappeared. About the year 1857, new silver coin, issued by the Brazilian Government, was introduced; elegant pieces of money of convenient values, answering nearly to our sixpenny, shilling, and two shilling pieces. Neither gold, silver, nor paper, however, was of much use on a journey like the one I had now undertaken. All travellers on the branch rivers have to carry cloth, cashaça, and small wares, to exchange for produce or food with the Indians; a small quantity of copper money, the only coin whose value is understood amongst the remote settlers, being nevertheless necessary to balance exchanges. When I had to

* I take this opportunity of mentioning my obligations to Mr. George Brocklehurst, of the Pará firm, by whom, during the latter years of my travels in the interior, my wants were attended to in the promptest and kindest manner.

send collections down to Pará to be shipped for England, which happened three or four times a year, I used to arrange with any trader who was dispatching a vessel to the capital with produce; the owners very often charging nothing for the carriage. Sometimes I had to entrust chests full of choice specimens to Indians for a voyage of thirty or forty days: a word to the Pilot recommending him to keep the boxes free from damp was quite sufficient. I never suffered any loss or damage.

Our course lay due west for about twenty miles. The wind increased as we neared Point Cururú, where the river bends from its northern course. A vast expanse of water here stretches to the west and south, and the waves, with a strong breeze, run very high. As we were doubling the Point, the cable which held our montaria in tow astern, parted, and in endeavouring to recover the boat, without which we knew it would be difficult to get ashore on many parts of the coast, we were very near capsizing. We tried to tack down the river; a vain attempt with a strong breeze and no current. Our ropes snapped, the sails flew to rags, and the vessel, which we now found was deficient in ballast, heeled over frightfully. Contrary to José's advice, I ran the cuberta into a little bay, thinking to cast anchor there and wait for the boat coming up with the wind; but the anchor dragged on the smooth sandy bottom, and the vessel went broadside on to the rocky beach. With a little dexterous management, but not until after we had sustained some severe bumps, we

managed to get out of this difficulty, clearing the rocky point at a close shave with our jib-sail. Soon after we drifted into the smooth water of a sheltered bay which leads to the charmingly situated village of Altar do Chaõ; and we were obliged to give up our attempt to recover the montaria.

The little settlement, Altar do Chaõ—altar of the ground, or Earth altar—owes its singular name to the existence at the entrance to the harbour of one of those strange flat-topped hills which are so common in this part of the Amazons country, shaped like the high altar in Roman Catholic churches. It is an isolated one and much lower in height than the similarly truncated hills and ridges near Almeyrim, being elevated probably not more than 300 feet above the level of the river. It is bare of trees, but covered in places with a species of fern. At the head of the bay is an inner harbour which communicates by a channel with a series of lakes lying in the valleys between hills and stretching far into the interior of the land. The village is peopled almost entirely by semi-civilised Indians to the number of sixty or seventy families, and the scattered houses are arranged in broad streets on a strip of green sward at the foot of a high, gloriously-wooded ridge.

We stayed here nine days. As soon as we anchored I went ashore and persuaded, by the offer of a handsome reward, two young half-breeds to go in search of my missing boat. The head man of the place, Captain Thomas, a sleepy-looking mameluco, whom I found in his mud-walled cottage in loose shirt and drawers, with

a large black rosary round his neck, promised me two Indians to complete my crew, if I would wait a few days until they had finished felling trees for a new plantation. Meantime my men had to make a new sail and repair the rigging, and I explored the rich woods of the vicinity.

Captain Thomas sent his son one day to show me the best paths. A few steps behind the houses we found ourselves in the virgin forest. The soil was sandy, and the broad path sloped gently up towards the high ridge which forms so beautiful a back-ground to the village. From the top of the hill a glimpse of the bay is obtained through the crowns of the trees. The road then descends, and so continues for many miles over hill and dale. There are no habitations, however, in this direction ; the road having been made by people formerly employed in felling timber. The forest at Altar do Chaõ is noted for its riches in choice woods, and its large laurel and Itauba trees, which are used in building river schooners. The beautiful tortoise-shell wood, Moira pinímã, minutely barred and spotted with red and black, which is made into walking-sticks by Brazilian carpenters, and exported as such in some numbers to Portugal, was formerly abundant here ; it is the heart-wood of a tree I believe unknown to science, and is obtainable only in logs a few inches in diameter. The Moira coatiára (striped wood), a most beautiful material for cabinet work, being close-grained and richly streaked with chocolate-brown on a yellow ground, is another of these, and is also the heart-wood of a tree, but obtainable in logs a foot or

more in diameter and ten feet in length. A rare wood called Sápu-píra, of excessively hard texture, deep brown in colour, thickly speckled with yellow, is also a product of these forests. Captain Thomas showed me a mortar, four feet high, for pounding coffee, made of it. Many other kinds of ornamental and useful timber are met with, including a kind of box, which I saw made into carpenters' planes; ebony and marupá; the last-mentioned a light whitish wood of the same texture as mahogany. Although the trees have been felled near the village, more of the same kinds are said to exist in the forest, which extends to an unknown distance in the interior. I heard here, also, of the Mururé, a lofty tree which yields a yellow milk of remarkable virtues, on making incisions in the bark. It is called by the Portuguese Mercurio vegetal, or vegetable mercury, from the cures it effects when taken internally in syphilitic rheumatism. It is said to produce terrible pains in the limbs soon after it is taken, but the cure is certain. I was never able to get a sight of this tree. Captain Thomas said that the only specimen he knew of it, had been cut down. Persons in Santarem had attempted to send samples of the milk to Europe for experiment, but they had failed on account of the stone bottles in which it was contained always bursting in transit.

We walked two or three miles along this dark and silent forest road, and then struck off through the thicket to another path running parallel to it, by which we returned to the village. About half way we passed through a tract of wood, densely overgrown with the

Curuá palm tree; the natives call a place of this kind a Pindobál. The rigid, elegantly pinnated leaves, twenty feet in length, grow, as I have before described, directly out of the ground. I had frequently occasion to notice in the virgin forests some one kind of palm, growing abundantly in society in one limited tract although scarce elsewhere, no difference of soil, altitude, or humidity being apparent to account for the phenomenon. The Pindobál covered an area of probably four or five acres, and the whole lay under the shade of the tall forest trees. The last half mile of our road led through a more humid part of the forest near the low shores of the lake. We here saw a Couxio monkey (Pithecia satanas), a large black species which, as I have before mentioned, has a thick cap of hair on the head parted at the crown. He was seated alone on a branch fingering a cluster of flowers that lay within his reach. My companion fired at him, but missed, and he then slowly moved away. The borders of the path were enlivened with troops of small and delicate butterflies. I succeeded in capturing, in about half an hour, no less than eight species of one genus, Mesosemia; a group remarkable for having the wings ornamented with central eye-like spots encircled by fine black and gray concentric lines arranged in different patterns according to the species.

I was so much pleased with the situation of this settlement, and the number of rare birds and insects which tenanted the forest, that I revisited it in the following year, and spent four months making collec-

tions. The village itself is a neglected, poverty-stricken place: the governor (Captain of Trabalhadores or Indian workmen) being an old, apathetic half-breed, who had spent all his life here. The priest was a most profligate character; I seldom saw him sober; he was a white, however, and a man of good ability. I may as well mention here, that a moral and zealous priest is a great rarity in this province: the only ministers of religion in the whole country who appeared sincere in their calling, being the Bishop of Pará and the Vicars of Ega on the Upper Amazons and Obydos. The houses in the village swarmed with vermin; bats in the thatch; fire-ants (formiga de fogo) under the floors; cockroaches and spiders on the walls. Very few of them had wooden doors and locks. Altar do Chaõ was originally a settlement of the aborigines, and was called Burarí. The Indians were always hostile to the Portuguese, and during the disorders of 1835-6 joined the rebels in the attack on Santarem. Few of them escaped the subsequent slaughter, and for this reason there is now scarcely an old or middle-aged man in the place. As in all the semi-civilised villages where the original orderly and industrious habits of the Indian have been lost without anything being learnt from the whites to make amends, the inhabitants live in the greatest poverty. The scarcity of fish in the clear waters and rocky bays of the neighbourhood is no doubt partly the cause of the poverty and perennial hunger which reign here. When we arrived in the port our canoe was crowded with the half-naked villagers—men, women, and children, who came to beg each a piece of

salt pirarucu "for the love of God." They are not quite so badly off in the dry season. The shallow lakes and bays then contain plenty of fish, and the boys and women go out at night to spear them by torchlight; the torches being made of thin strips of green bark from the leaf-stalks of palms, tied in bundles. Many excellent kinds of fish are thus obtained; amongst them the Pescada, whose white and flaky flesh, when boiled, has the appearance and flavour of cod-fish; and the Tucunaré (Cichla temensis), a handsome species, with a large prettily-coloured, eye-like spot on its tail. Many small Salmonidæ are also met with, and a kind of sole, called Aramassá, which moves along the clear sandy bottom of the bay. At these times a species of sting-ray is common on the sloping beach, and bathers are frequently stung most severely by it. The weapon of this fish is a strong blade with jagged edges, about three inches long, growing from the side of the long fleshy tail. I once saw a woman wounded by it whilst bathing; she shrieked frightfully, and was obliged to be carried to her hammock, where she lay for a week in great pain; I have known strong men to be lamed for many months by the sting.

There was a mode of taking fish here which I had not before seen employed, but found afterwards to be very common on the Tapajos. This is by using a poisonous liana called Timbó (Paullinia pinnata). It will act only in the still waters of creeks and pools. A few rods, a yard in length, are mashed and soaked in the water, which quickly becomes discoloured with the milky de-

leterious juice of the plant. In about half an hour all the smaller fishes, over a rather wide space around the spot, rise to the surface floating on their sides, and with the gills wide open. The poison acts evidently by suffocating the fishes; it spreads slowly in the water, and a very slight mixture seems sufficient to stupify them. I was surprised, on beating the water in places where no fishes were visible in the clear depths for many yards round, to find, sooner or later, sometimes 24 hours afterwards, a considerable number floating dead on the surface.

The people occupy themselves the greater part of the year with their small plantations of mandioca. All the heavy work, such as felling and burning the timber, planting and weeding, is done in the plantation of each family by a congregation of neighbours, which they call a "pucherum:"—a similar custom to the "bee" in the backwood settlements of North America. They make quite a holiday of each pucherum. When the invitation is issued, the family prepares a great quantity of fermented drink, called in this part Tarobá, from soaked mandioca cakes, and porridge of Manicueira. This latter is a kind of sweet mandioca, very different from the Yuca of the Peruvians and Macasheira of the Brazilians (Manihot Aypi), having oblong juicy roots, which become very sweet a few days after they are gathered. With these simple provisions they regale their helpers. The work is certainly done, but after a very rude fashion; all become soddened with Tarobá, and the day finishes often in a drunken brawl.

The climate is rather more humid than that of Santarem. I suppose this is to be attributed to the neighbouring country being densely wooded, instead of an open campo. In no part of the country did I enjoy more the moonlit nights than here, in the dry season. After the day's work was done I used to go down to the shores of the bay, and lay all my length on the cool sand for two or three hours before bed-time. The soft pale light, resting on the broad sandy beaches and palm-thatched huts, reproduced the effect of a mid-winter scene in the cold north when a coating of snow lies on the landscape. A heavy shower falls about once a week, and the shrubby vegetation never becomes parched up as at Santarem. Between the rains the heat and dryness increase from day to day: the weather on the first day after the rain is gleamy with intervals of melting sunshine and passing clouds; the next day is rather drier, and the east wind begins to blow; then follow days of cloudless sky, with gradually increasing strength of breeze. When this has continued about a week a light mistiness begins to gather about the horizon; clouds are formed; grumbling thunder is heard, and then, generally in the night-time, down falls the refreshing rain. The sudden chill caused by the rains produces colds, which are accompanied by the same symptoms as in our own climate; with this exception the place is very healthy.

*June* 17*th*.—The two young men returned without meeting with my montaria, and I found it impossible here to buy a new one. Captain Thomás could find me only one hand. This was a blunt-spoken but willing

young Indian, named Manoel. He came on board this morning at eight o'clock, and we then got up our anchor and resumed our voyage.

The wind was light and variable all day, and we made only about fifteen miles by seven o'clock in the evening. The coast formed a succession of long, shallow bays with sandy beaches, on which the waves broke in a long line of surf. Ten miles above Altar do Chaõ is a conspicuous headland, called Point Cajetúba. During a lull of the wind, towards midday, we ran the cuberta aground in shallow water and waded ashore, but the woods were scarcely penetrable, and not a bird was to be seen. The only thing observed worthy of note, was the quantity of drowned winged ants along the beach; they were all of one species, the terrible formiga de fogo (Myrmica sævissima); the dead, or half-dead bodies of which were heaped up in a line an inch or two in height and breadth, the line continuing without interruption for miles at the edge of the water. The countless thousands had been doubtless cast into the river whilst flying during a sudden squall the night before, and afterwards cast ashore by the waves. We found ourselves at seven o'clock near the mouth of a creek leading to a small lake, called Aramána-í, and the wind having died away, we anchored, guided by the lights ashore, near the house of a settler, named Jeronymo, whom I knew, and who, soon after, showed us a snug little harbour, where we could remain in safety for the night. The river here cannot be less than ten miles broad; it is quite clear of islands and free from shoals at this season of the year. The opposite coast appeared in the

daytime as a long thin line of forest, with dim gray hills in the back ground.

*June 18th and 19th.*—Senhor Jeronymo promised to sell me a montaria, so I waited for three hours after sunrise the next morning, expecting it to be forthcoming, but in vain. I sent Pinto and afterwards José to enquire about it, but they, instead of performing the errand, joined the easy-natured master of the house in a morning carousal. I was obliged, when my patience was exhausted, to go after them, having to clamber down a projecting bough, in the absence of a boat, to get ashore; and then found my two men, their host, and two or three neighbours, lolling in hammocks, tinkling wire guitars, and drinking cashaça. I mention this as a sample of a very common class of incidents in Brazilian travelling. Master Jeronymo backed out of his promise regarding the montaria. José and Pinto, who seemed to think they had done nothing wrong, sulkily obeyed my order to go on board, and we again got under way. The wind failed us on the 18th towards three p.m. About six miles above Aramána-í we rounded a rocky point, called Acarátingarí, the distance travelled being altogether not more than twelve miles. The greater part of the day was thus lost: we passed the night in a snug little harbour sheltered by trees.

To-day (19th) we had a good wind, which carried us to the mouth of a creek, called Paquiatúba, where the "inspector" of the district lived, Senhor Cypriano, for whom I had brought an order from Captain Thomás to supply me with another hand. We had great difficulty in finding a place to land. The coast in this part

was a tract of level, densely-wooded country, through which flowed the winding rivulet, or creek, which gives its name to a small scattered settlement hidden in the wilderness ; the hills here receding two or three miles towards the interior. A large portion of the forest was flooded, the trunks of the very high trees near the mouth of the creek standing 18 feet deep in water. We lost two hours working our way with poles through the inundated woods in search of the port. Every inlet we tried ended in a labyrinth choked up with bushes, but we were at length guided to the right place by the crowing of cocks. On shouting for a montaria an Indian boy made his appearance, guiding one through the gloomy thickets ; but he was so alarmed, I suppose at the apparition of a strange-looking white man in spectacles bawling from the prow of the vessel, that he shot back quickly into the bushes. He returned when Manoel spoke, and we went ashore: the montaria winding along a gloomy overshadowed water-path, made by cutting away the lower branches and underwood. The foot-road to the houses was a narrow, sandy alley, bordered by trees of stupendous height, overrun with creepers, and having an unusual number of long air-roots dangling from the epiphytes on their branches.

After passing one low smoky little hut, half-buried in foliage, the path branched off in various directions, and the boy having left us we took the wrong turn. We were brought to a stand soon after by the barking of dogs ; and on shouting, as is customary on approaching a dwelling, "O da casa!" (Oh of the house!) a dark-skinned native, a Cafuzo, with a most unpleasant ex-

pression of countenance, came forth through the tangled maze of bushes, armed with a long knife, with which he pretended to be whittling a stick. He directed us to the house of Cypriano, which was about a mile distant along another forest road. The circumstance of the Cafuzo coming out armed to receive visitors very much astonished my companions, who talked it over at every place we visited for several days afterwards ; the freest and most unsuspecting welcome in these retired places being always counted upon by strangers. But, as Manoel remarked, the fellow may have been one of the unpardoned rebel leaders who had settled here after the recapture of Santarem in 1836, and lived in fear of being enquired for by the authorities of Santarem. After all our trouble we found Cypriano absent from home. His house was a large one, and full of people, old and young, women and children, all of whom were Indians or mamelucos. Several smaller huts surrounded the large dwelling, besides extensive open sheds containing mandioca ovens and rude wooden mills for grinding sugar-cane to make molasses. All the buildings were embosomed in trees: it would be scarcely possible to find a more retired nook, and an air of contentment was spread over the whole establishment. Cypriano's wife, a good-looking mameluco girl, was superintending the packing of farinha. Two or three old women, seated on mats, were making baskets with narrow strips of bark from the leaf-stalks of palms, whilst others were occupied lining them with the broad leaves of a species of maranta, and filling them afterwards with farinha, which was previously measured in a rude square vessel. It

appeared that Senhor Cypriano was a large producer of the article, selling 300 baskets (sixty pounds' weight each) annually to Santarem traders. I was sorry we were unable to see him, but it was useless waiting, as we were told all the men were at present occupied in "puche-rums," and he would be unable to give me the assistance I required. We returned to the canoe in the evening, and, after moving out into the river, anchored and slept.

*June 20th.*—We had a light, baffling wind off shore all day on the 20th, and made but fourteen or fifteen miles by six p.m.; when, the wind failing us, we anchored at the mouth of a narrow channel, called Tapaiúna, which runs between a large island and the mainland. About three o'clock we passed in front of Boim, a village on the opposite (western) coast. The breadth of the river is here six or seven miles: a confused patch of white on the high land opposite was all we saw of the village, the separate houses being undistinguishable on account of the distance. The coast along which we sailed to-day is a continuation of the low and flooded land of Paquiatúba.

*June 21st.*—The next morning we sailed along the Tapaiúna channel, which is from 400 to 600 yards in breadth. We advanced but slowly, as the wind was generally dead against us, and stopped frequently to ramble ashore. Wherever the landing-place was sandy it was impossible to walk about, on account of the swarms of the terrible fire-ant, whose sting is likened by the Brazilians to the puncture of a red-hot needle. There was scarcely a square inch of ground free from them. About three p.m. we glided into a quiet, shady

creek, on whose banks an industrious white settler had located himself. I resolved to pass the rest of the day and night here, and endeavour to obtain a fresh supply of provisions, our stock of salt beef being now nearly exhausted. The situation of the house was beautiful; the little harbour being gay with water plants, Pontederiæ, now full of purple blossom, from which flocks of Piosócas started up screaming as we entered. The owner sent a boy with my men to show them the best place for fish up the creek, and in the course of the evening sold me a number of fowls, besides baskets of beans and farinha. The result of the fishing was a good supply of Jandiá, a handsome spotted Siluride fish, and Piránha, a kind of Salmonidæ (Tetragonopterus). Piránhas are of several kinds, many of which abound in the waters of the Tapajos. They are caught with almost any kind of bait, for their taste is indiscriminate and their appetite most ravenous. They often attack the legs of bathers near the shore, inflicting severe wounds with their strong triangular teeth. At Paquiatúba and this place I added about twenty species of small fishes to my collection; caught by hook and line, or with the hand in shallow pools under the shade of the forest.

My men slept ashore, and on their coming aboard in the morning Pinto was drunk and insolent. According to José, who had kept himself sober, and was alarmed at the other's violent conduct, the owner of the house and Pinto had spent the greater part of the night together, drinking aguardente de beijú,—a spirit distilled from the mandioca root. We knew nothing of the

antecedents of this man, who was a tall, strong, self-willed fellow, and it began to dawn on us that this was not a very safe travelling companion in a wild country like this. I thought it better now to make the best of our way to the next settlement, Aveyros, and get rid of him. Our course to-day lay along a high, rocky coast, which extended without a break for about eight miles. The height of the perpendicular rocks was from 100 to 150 feet; ferns and flowering shrubs grew in the crevices, and the summit supported a luxuriant growth of forest, like the rest of the river banks. The waves beat with loud roar at the foot of these inhospitable barriers. At two p.m. we passed the mouth of a small picturesque harbour, formed by a gap in the precipitous coast. Several families have here settled; the place is called Itá-puáma, or "standing rock," from a remarkable isolated cliff, which stands erect at the entrance to the little haven. A short distance beyond Itá-puáma we found ourselves opposite to the village of Pinhel, which is perched, like Boim, on high ground, on the western side of the river. The stream is here from six to seven miles wide. A line of low islets extends in front of Pinhel, and a little further to the south is a larger island, called Capitarí, which lies nearly in the middle of the river.

*June 23rd.*—The wind freshened at ten o'clock in the morning of the 23rd. A thick black cloud then began to spread itself over the sky a long way down the river; the storm which it portended, however, did not reach us, as the dark threatening mass crossed from east to west, and the only effect it had was to impel a

column of cold air up river, creating a breeze with which we bounded rapidly forward. The wind in the afternoon strengthened to a gale; we carried on with one foresail only, two of the men holding on to the boom to prevent the whole thing from flying to pieces. The rocky coast continued for about twelve miles above Itá-puáma: then succeeded a tract of low marshy land, which had evidently been once an island whose channel of separation from the mainland had become silted up. The island of Capitarí and another group of islets succeeding it, called Jacaré, on the opposite side, helped also to contract at this point the breadth of the river, which was now not more than about three miles. The little cuberta almost flew along this coast, there being no perceptible current, past extensive swamps, margined with thick floating grasses. At length, on rounding a low point, higher land again appeared on the right bank of the river, and the village of Aveyros hove in sight, in the port of which we cast anchor late in the afternoon.

Aveyros is a small settlement, containing only fourteen or fifteen houses besides the church; but it is the place of residence of the authorities of a large district; the priest, Juiz de Paz, the subdelegado of police, and the Captain of the Trabalhadores. The district includes Pinhel, which we passed about twenty miles lower down on the left bank of the river. Five miles beyond Aveyros, and also on the left bank, is the missionary village of Santa Cruz, comprising thirty or forty families of baptised Mundurucú Indians, who are at present under the management of a Capuchin Friar, and are independent of the Captain of Trabalhadores of Aveyros.

The river view from this point towards the south was very grand; the stream is from two to three miles broad, with green islets resting on its surface, and on each side a chain of hills stretches away in long perspective. I resolved to stay here for a few weeks to make collections. On landing, my first care was to obtain a house or room that I might live ashore. This was soon arranged; the head man of the place, Captain Antonio, having received notice of my coming, so that before night all the chests and apparatus I required were housed and put in order for working.

I here dismissed Pinto, who again got drunk and quarrelsome a few hours after he came ashore. He left the next day to my great relief in a small trading canoe that touched at the place on its way to Santarem. The Indian Manoel took his leave at the same time, having engaged to accompany me only as far as Aveyros; I was then dependent on Captain Antonio for fresh hands. The captains of Trabalhadores are appointed by the Brazilian Government, to embody the scattered Indian labourers and canoe-men of their respective districts, to the end that they may supply passing travellers with men when required. A semi-military organisation is given to the bodies; some of the steadiest amongst the Indians themselves being nominated as sergeants, and all the members mustered at the principal village of their district twice a-year. The captains, however, universally abuse their authority, monopolising the service of the men for their own purposes, so that it is only by favour that the loan of a canoe-hand can be wrung from them. I was treated

by Captain Antonio with great consideration, and promised two good Indians when I should be ready to continue my voyage.

Little happened worth narrating, during my forty days' stay at Aveyros. The time was spent in the quiet, regular pursuit of Natural History : every morning I had my long ramble in the forest, which extended to the back-doors of the houses, and the afternoons were occupied in preserving and studying the objects collected. The priest was a lively old man, but rather a bore from being able to talk of scarcely anything except homœopathy, having been smitten with the mania during a recent visit to Santarem. He had a Portuguese Homœopathic Dictionary, and a little leather case containing glass tubes filled with globules, with which he was doctoring the whole village. A bitter enmity seemed to exist between the female members of the priest's family and those of the captain's ; the only white women in the settlement. It was amusing to notice how they flaunted past each other, when going to church on Sundays, in their starched muslin dresses. I found an intelligent young man living here, a native of the province of Goyaz, who was exploring the neighbourhood for gold and diamonds. He had made one journey up a branch river, and declared to me, that he had found one diamond, but was unable to continue his researches, because the Indians who accompanied him refused to remain any longer : he was now waiting for Captain Antonio to assist him with fresh men, having offered him in return a share in the results of the enterprise. There appeared to be no

doubt, that gold is occasionally found within two or three days' journey of Aveyros; but all lengthened search is made impossible by the scarcity of food and the impatience of the Indians, who see no value in the precious metal, and abhor the tediousness of the gold-searcher's occupation. It is impossible to do without them, as they are required to paddle the canoes.

The weather, during the month of July, was uninterruptedly fine; not a drop of rain fell, and the river sank rapidly. The mornings, for two hours after sunrise, were very cold; we were glad to wrap ourselves in blankets on turning out of our hammocks, and walk about at a quick pace in the early sunshine. But in the afternoons the heat was sickening; for the glowing sun then shone full on the front of the row of whitewashed houses, and there was seldom any wind to moderate its effects. I began now to understand why the branch rivers of the Amazons were so unhealthy, whilst the main stream was pretty nearly free from diseases arising from malaria. The cause lies, without doubt, in the slack currents of the tributaries in the dry season, and the absence of the cooling Amazonian trade-wind, which purifies the air along the banks of the main river. The trade-wind does not deviate from its nearly straight westerly course, so that the branch streams, which run generally at right angles to the Amazons, and have a slack current for a long distance from their mouths, are left to the horrors of nearly stagnant air and water.

Aveyros may be called the head-quarters of the fire-ant, which might be fittingly termed the scourge of this fine river. The Tapajos is nearly free from

the insect pests of other parts, mosquitoes, sand-flies, Motúcas and piums; but the formiga de fogo is perhaps a greater plague than all the others put together. It is found only on sandy soils in open places, and seems to thrive most in the neighbourhood of houses and weedy villages, such as Aveyros: it does not occur at all in the shades of the forest. I noticed it in most places on the banks of the Amazons, but the species is not very common on the main river, and its presence is there scarcely noticed, because it does not attack man, and the sting is not so virulent as it is in the same species on the banks of the Tapajos. Aveyros was deserted a few years before my visit on account of this little tormentor, and the inhabitants had only recently returned to their houses, thinking its numbers had decreased. It is a small species, of a shining reddish colour, not greatly differing from the common red stinging ant of our own country (Myrmica rubra), except that the pain and irritation caused by its sting are much greater. The soil of the whole village is undermined by it: the ground is perforated with the entrances to their subterranean galleries, and a little sandy dome occurs here and there, where the insects bring their young to receive warmth near the surface. The houses are overrun with them; they dispute every fragment of food with the inhabitants, and destroy clothing for the sake of the starch. All eatables are obliged to be suspended in baskets from the rafters, and the cords well soaked with copaüba balsam, which is the only means known of preventing them from climbing. They seem to attack persons out of sheer malice: if we stood for a few

moments in the street, even at a distance from their nests, we were sure to be overrun and severely punished, for the moment an ant touched the flesh, he secured himself with his jaws, doubled in his tail, and stung with all his might. When we were seated on chairs in the evenings in front of the house to enjoy a chat with our neighbours, we had stools to support our feet, the legs of which as well as those of the chairs, were well anointed with the balsam. The cords of hammocks are obliged to be smeared in the same way to prevent the ants from paying sleepers a visit.

The inhabitants declare that the fire-ant was unknown on the Tapajos, before the disorders of 1835-6, and believe that the hosts sprang up from the blood of the slaughtered Cabanas. They have, doubtless, increased since that time, but the cause lies in the depopulation of the villages and the rank growth of weeds in the previously cleared, well-kept spaces. I have already described the line of sediment formed on the sandy shores lower down the river by the dead bodies of the winged individuals of this species. The exodus from their nests of the males and females takes place at the end of the rainy season (June), when the swarms are blown into the river by squalls of wind, and subsequently cast ashore by the waves. I was told that this wholesale destruction of ant-life takes place annually, and that the same compact heap of dead bodies which I saw only in part, extends along the banks of the river for twelve or fifteen miles.

The forest behind Aveyros yielded me little except insects, but in these it was very rich. It is not too

dense, and broad sunny paths skirted by luxuriant beds of Lycopodiums, which form attractive sporting places for insects, extend from the village to a swampy hollow or ygapó, which lies about a mile inland. Of butterflies alone I enumerated fully 300 species, captured or seen in the course of forty days within a half-hour's walk of the village. This is a greater number than is found in the whole of Europe. The only monkey I observed was the Callithrix moloch—one of the kinds called by the Indians Whaiápu-saí. It is a moderately-sized species, clothed with long brown hair, and having hands of a whitish hue. Although nearly allied to the Cebi it has none of their restless vivacity, but is a dull, listless animal. It goes in small flocks of five or six individuals, running along the main boughs of the trees. One of the specimens which I obtained here was caught on a low fruit-tree at the back of our house at sunrise one morning. This was the only instance of a monkey being captured in such a position that I ever heard of. As the tree was isolated it must have descended to the ground from the neighbouring forest and walked some distance to get at it. The species is sometimes kept in a tame state by the natives: it does not make a very amusing pet, and survives captivity only a short time.

I heard that the white Cebus, the Caiarára branca, a kind of monkey I had not yet seen, and wished very much to obtain, inhabited the forests on the opposite side of the river; so one day on an opportunity being afforded by our host going over in a large boat, I crossed to go in search of it. We were about twenty per-

sons in all, and the boat was an old ricketty affair with the gaping seams rudely stuffed with tow and pitch. In addition to the human freight we took three sheep with us, which Captain Antonio had just received from Santarem and was going to add to his new cattle farm on the other side. Ten Indian paddlers carried us quickly across. The breadth of the river could not be less than three miles, and the current was scarcely perceptible. When a boat has to cross the main Amazons, it is obliged to ascend along the banks for half a mile or more to allow for drifting by the current; in this lower part of the Tapajos this is not necessary. When about half-way, the sheep, in moving about, kicked a hole in the bottom of the boat. The passengers took the matter very coolly, although the water spouted up alarmingly, and I thought we should inevitably be swamped. Captain Antonio took off his socks to stop the leak, inviting me and the Juiz de paz, who was one of the party, to do the same, whilst two Indians baled out the water with large cuyas. We thus managed to keep afloat until we reached our destination, when the men patched up the leak for our return journey.

The landing-place lay a short distance within the mouth of a shady inlet, on whose banks, hidden amongst the dense woods, were the houses of a few Indian and mameluco settlers. The path to the cattle farm led first through a tract of swampy forest; it then ascended a slope and emerged on a fine sweep of prairie, varied with patches of timber. The wooded portion occupied the hollows where the soil was of a rich chocolate-

brown colour, and of a peaty nature. The higher grassy undulating parts of the campo had a lighter and more sandy soil. Leaving our friends, I and José took our guns and dived into the woods in search of the monkeys. As we walked rapidly along I was very near treading on a rattlesnake which lay stretched out nearly in a straight line on the bare sandy pathway. It made no movement to get out of the way, and I escaped the danger by a timely and sudden leap, being unable to check my steps in the hurried walk. We tried to excite the sluggish reptile by throwing handsfull of sand and sticks at it, but the only notice it took was to raise its ugly horny tail and shake its rattle. At length it began to move rather nimbly, when we despatched it by a blow on the head with a pole, not wishing to fire on account of alarming our game.

We saw nothing of the white Caiarára; we met, however, with a flock of the common light-brown allied species (Cebus albifrons?), and killed one as a specimen. A resident on this side of the river told us that the white kind was found further to the south, beyond Santa Cruz. The light-brown Caiarára is pretty generally distributed over the forests of the level country. I saw it very frequently on the banks of the Upper Amazons, where it was always a treat to watch a flock leaping amongst the trees, for it is the most wonderful performer in this line of the whole tribe. The troops consist of thirty or more individuals which travel in single file. When the foremost of the flock reaches the outermost branch of an unusually lofty tree, he springs forth into the air without a moment's hesitation

and alights on the dome of yielding foliage belonging to the neighbouring tree, maybe fifty feet beneath ; all the rest following the example. They grasp, on falling, with hands and tail, right themselves in a moment, and then away they go along branch and bough to the next tree. The Caiarára owes its name in the Tupí language, macaw or large-headed (Acain, head, and Arára macaw), to the disproportionate size of the head compared with the rest of the body. It is very frequently kept as a pet in houses of natives. I kept one myself for about a year, which accompanied me in my voyages and became very familiar, coming to me always on wet nights to share my blanket. It is a most restless creature, but is not playful like most of the American monkeys ; the restlessness of its disposition seeming to arise from great nervous irritability and discontent. The anxious, painful, and changeable expression of its countenance, and the want of purpose in its movements, betray this. Its actions are like those of a wayward child ; it does not seem happy even when it has plenty of its favourite food, bananas ; but will leave its own meal to snatch the morsels out of the hands of its companions. It differs in these mental traits from its nearest kindred, for another common Cebus, found in the same parts of the forest, the Prego monkey (Cebus cirrhifer ?), is a much quieter and better-tempered animal ; it is full of tricks, but these are generally of a playful character.

The Caiarára keeps the house in a perpetual uproar where it is kept : when alarmed, or hungry, or excited by envy, it screams piteously ; it is always, however,

making some noise or other, often screwing up its mouth and uttering a succession of loud notes resembling a whistle. My little pet, when loose, used to run after me, supporting itself for some distance on its hind legs, without, however, having been taught to do it. He offended me greatly one day by killing, in one of his jealous fits, another and much choicer pet—the nocturnal, owl-faced monkey (Nyctipithecus trivirgatus). Some one had given this a fruit, which the other coveted, so the two got to quarrelling. The Nyctipithecus fought only with its paws, clawing out and hissing like a cat; the other soon obtained the mastery, and before I could interfere, finished his rival by cracking its skull with his teeth. Upon this I got rid of him.

After a ramble of four or five hours, during which José shot a beautiful green and black-striped lizard of the Iguana family, from the trunk of a tree, and I filled my insect box with new and rare species (including an extremely beautiful butterfly of the genus Heliconius, H. Hermathena), we rejoined our companions at a hut, in the middle of the campo, where the Indians lived who had charge of the cattle. A tract of land like this, several miles in extent, alternating prairie and woodland, would be a rich possession in a better peopled country. The few oxen seemed to thrive on the nutritious grasses, and to make all complete there was a little lake in the low grounds, surrounded by fan-leaved Caraná palms, where the cattle could be watered all the year round. The farm was at present new, and the men said they had not yet been visited by jaguars. The

poor fellows seemed to fare very badly. Captain Antonio treated all his Indians like slaves; paying them no wages and stinting them to scanty rations of salt fish and farinha. There was an air of poverty and misery over the whole establishment, which produced a very disagreeable impression: these are certainly not the people to develope the resources of a fine country like this.

On recrossing the river to Aveyros in the evening, a pretty little parrot fell from a great height headlong into the water near the boat; having dropped from a flock which seemed to be fighting in the air. One of the Indians secured it for me, and I was surprised to find the bird uninjured. There had probably been a quarrel about mates, resulting in our little stranger being temporarily stunned by a blow on the head from the beak of a jealous comrade. The species was the Conurus guianensis, called by the natives Maracaná; the plumage green, with a patch of scarlet under the wings. I wished to keep the bird alive and tame it, but all our efforts to reconcile it to captivity were vain; it refused food, bit every one who went near it, and damaged its plumage in its exertions to free itself. My friends in Aveyros said that this kind of parrot never became domesticated. After trying nearly a week I was recommended to lend the intractable creature to an old Indian woman, living in the village, who was said to be a skilful bird-tamer. In two days she brought it back almost as tame as the familiar love-birds of our aviaries. I kept my little pet for upwards of two years; it learned to talk pretty well, and was con-

sidered quite a wonder as being a bird usually so difficult of domestication. I do not know what arts the old woman used: Captain Antonio said she fed it with her saliva. The chief reason why almost all animals become so wonderfully tame in the houses of the natives is, I believe, their being treated with uniform gentleness, and allowed to run at large about the rooms. Our Maracaná used to accompany us sometimes in our rambles, one of the lads carrying it on his head. One day, in the middle of a long forest road, it was missed, having clung probably to an overhanging bough and escaped into the thickets without the boy perceiving it. Three hours afterwards, on our return by the same path, a voice greeted us in a colloquial tone as we passed "Maracaná!" We looked about for some time, but could not see anything until the word was repeated with emphasis "Maracaná-á!" when we espied the little truant half concealed in the foliage of a tree. He came down and delivered himself up evidently as much rejoiced at the meeting as we were.

After I had obtained the two men promised, stout young Indians, 17 or 18 years of age, one named Ricardo and the other Alberto, I paid a second visit to the western side of the river in my own canoe; being determined, if possible, to obtain specimens of the White Cebus. We crossed over first to the mission village, Santa Cruz. It consists of 30 or 40 wretched-looking mud huts, closely built together in three straight ugly rows on a high gravelly bank. The place was deserted with the exception of two or three old men and women and a few children. The missionary, Fré Isidro, an

Italian monk, was away at another station called Wishitúba, two days' journey farther up the river. Report said of him that he had no zeal for religion or devotion to his calling, but was occupied in trading, using the Indian proselytes to collect salsaparilla and so forth, with a view to making a purse wherewith to retire to his own country. The semi-civilised Indians, who speak the Tupí language, called him Pai tucúra, or Father Grasshopper: his peaked hood having a droll resemblance to the pointed head of the insect. I afterwards became acquainted with Fré Isidoro, and found him a man of superior intelligence and ability. He complained much of the ill treatment the Indians received at the hands of traders and the Brazilian civil authorities, and said that he and his predecessors had incessantly to contend for the rights secured to the aborigines by the laws of the empire. The plan of assembling families in formal, blank-looking settlements, like this of Santa Cruz, seemed to me very ill chosen. The Indians would be happier in their scattered wigwams, embowered in foliage on the banks of shady rivulets where they prefer to settle when left to themselves.

A narrow belt of wood runs behind the village: beyond this is an elevated barren campo, with a clayey and gravelly soil. To the south the coast country is of a similar description; a succession of scantily-wooded hills, bare grassy spaces, and richly-timbered hollows. We traversed forest and campo in various directions during three days without meeting with monkeys, or indeed with anything that repaid us the time and trouble. The soil of the district appeared too dry; at this season

of the year I had noticed, in other parts of the country, that mammals and birds resorted to the more humid areas of forest, we therefore proceeded to explore carefully the low and partly swampy tract along the coast to the north of Santa Cruz. We spent two days in this way, landing at many places, and penetrating a good distance in the interior. Although unsuccessful with regard to the White Cebus, the time was not wholly lost, as I added several small birds of species new to my collection. On the second evening we surprised a large flock, composed of about 50 individuals, of a curious eagle with a very long and slender hooked beak, the Rostrhamus hamatus. They were perched on the bushes which surrounded a shallow lagoon separated from the river by a belt of floating grass: my men said they fed on toads and lizards found at the margins of pools. They formed a beautiful sight as they flew up and wheeled about at a great height in the air. We obtained only one specimen.

Before returning to Aveyros, we paid another visit to the Jacaré inlet leading to Captain Antonio's cattle farm, for the sake of securing further specimens of the many rare and handsome insects found there; landing at the port of one of the settlers. The owner of the house was not at home, and the wife, a buxom young woman, a dark mameluca, with clear though dark complexion and fine rosy cheeks, was preparing, in company with another stout-built Amazon, her rod and lines to go out fishing for the day's dinner. It was now the season for Tucunarés, and Senhora Joaquina showed us the fly baits used to take this kind of fish, which she

had made with her own hands of parrots' feathers. The rods used are slender bamboos, and the lines made from the fibres of pine-apple leaves. It is not very common for the Indian and half-caste women to provide for themselves in the way these spirited dames were doing, although they are all expert paddlers, and very frequently cross wide rivers in their frail boats without the aid of men. It is possible that parties of Indian women, seen travelling alone in this manner, may have given rise to the fable of a nation of Amazons invented by the first Spanish explorers of the country. Senhora Joaquina invited me and José to a Tucunaré dinner for the afternoon, and then shouldering their paddles and tucking up their skirts, the two dusky fisherwomen marched down to their canoe. We sent the two Indians into the woods to cut palm-leaves to mend the thatch of our cuberta, whilst I and José rambled through the woods which skirted the campo. On our return, we found a most bountiful spread in the house of our hostess. A spotless white cloth was laid on the mat, with a plate for each guest and a pile of fragrant newly-made farinha by the side of it. The boiled Tucunarés were soon taken from the kettles and set before us. I thought the men must be happy husbands who owned such wives as these. The Indian and mameluco women certainly do make excellent managers ; they are more industrious than the men and most of them manufacture farinha for sale on their own account, their credit always standing higher with the traders on the river than that of their male connections. I was quite surprised at the quantity of fish they had

taken ; there being sufficient for the whole party, including several children, two old men from a neighbouring hut, and my Indians. I made our good-natured entertainers a small present of needles and sewing-cotton, articles very much prized, and soon after we re-embarked, and again crossed the river to Aveyros.

*August 2nd.*—Left Aveyros ; having resolved to ascend a branch river, the Cuparí, which enters the Tapajos about eight miles above this village, instead of going forward along the main stream. I should have liked to visit the settlements of the Mundurucú tribe which lie beyond the first cataract of the Tapajos, if it had been compatible with the other objects I had in view. But to perform this journey a lighter canoe than mine would have been necessary, and six or eight Indian paddlers, which in my case it was utterly impossible to obtain. There would be, however, an opportunity of seeing this fine race of people on the Cuparí, as a horde was located towards the head waters of this stream. The distance from Aveyros to the last civilised settlement on the Tapajos, Itaitúba, is about forty miles. The falls commence a short distance beyond this place. Ten formidable cataracts or rapids then succeed each other at intervals of a few miles : the chief of which are the Coaitá, the Buburé, the Salto Grande about thirty feet high, and the Montanha. The canoes of Cuyabá tradesmen which descend annually to Santarem are obliged to be unloaded at each of these, and the cargoes carried by land on the backs of Indians, whilst the empty vessels are dragged by ropes over the obstructions. The Cuparí was described to me as flowing

through a rich moist clayey valley, covered with forests and abounding in game ; whilst the banks of the Tapajos beyond Aveyros were barren sandy campos, with ranges of naked or scantily-wooded hills, forming a kind of country which I had always found very unproductive in Natural History objects in the dry season which had now set in.

We entered the mouth of the Cuparí on the evening of the following day (August 3rd). It was not more than 100 yards wide, but very deep : we found no bottom in the middle with a line of eight fathoms. The banks were gloriously wooded ; the familiar foliage of the cacao growing abundantly amongst the mass of other trees reminding me of the forests of the main Amazons. We rowed for five or six miles, generally in a south-easterly direction although the river had many abrupt bends, and stopped for the night at a settler's house situated on a high bank and accessible only by a flight of rude wooden steps fixed in the clayey slope. The owners were two brothers, half-breeds, who with their families shared the large roomy dwelling ; one of them was a blacksmith, and we found him working with two Indian lads at his forge, in an open shed under the shade of mango trees. They were the sons of a Portuguese immigrant who had settled here forty years previously and married a Mundurucú woman. He must have been a far more industrious man than the majority of his countrymen who emigrate to Brazil now-a-days, for there were signs of former extensive cultivation at the back of the house in groves of orange, lemon, and coffee trees, and a large plantation of cacao occupied the lower grounds.

The next morning one of the brothers brought me a beautiful opossum which had been caught in the fowl-house a little before sunrise. It was not so large as a rat, and had soft brown fur, paler beneath and on the face, with a black stripe on each cheek. This made the third species of marsupial rat I had so far obtained: but the number of these animals is very considerable in Brazil, where they take the place of the shrews of Europe, shrew mice and, indeed, the whole of the insectivorous order of mammals, being entirely absent from Tropical America. One kind of these rat-like opossums is aquatic, and has webbed feet. The terrestrial species are nocturnal in their habits, sleeping during the day in hollow trees, and coming forth at night to prey on birds in their roosting places. It is very difficult to rear poultry in this country on account of these small opossums, scarcely a night passing in some parts in which the fowls are not attacked by them.

*August 5th.*—The river reminds me of some parts of the Jaburú channel, being hemmed in by two walls of forest rising to the height of at least 100 feet, and the outlines of the trees being concealed throughout by a dense curtain of leafy creepers. The impression of vegetable profusion and overwhelming luxuriance increases at every step. The deep and narrow valley of the Cuparí has a moister climate than the banks of the Tapajos. We have now frequent showers, whereas we left everything parched up by the sun at Aveyros.

After leaving the last sitio we advanced about eight miles and then stopped at the house of Senhor Antonio

Malagueita, a mameluco settler, whom we had been recommended to visit. His house and outbuildings were extensive, the grounds well wooded, and the whole wore an air of comfort and well-being which is very uncommon in this country. A bank of indurated white clay sloped gently up from the tree-shaded port to the house, and beds of kitchen-herbs extended on each side, with (rare sight !) rose and jasmine trees in full bloom. Senhor Antonio, a rather tall middle-aged man with a countenance beaming with good nature, came down to the port as soon as we anchored. I was quite a stranger to him, but he had heard of my coming and seemed to have made preparations. I never met with a heartier welcome. On entering the house, the wife, who had more of the Indian tint and features than her husband, was equally warm and frank in her greeting. Senhor Antonio had spent his younger days at Pará, and had acquired a profound respect for Englishmen. I stayed here two days. My host accompanied me in my excursions; in fact, his attentions, with those of his wife and the host of relatives of all degrees who constituted his household, were quite troublesome, as they left me not a moment's privacy from morning till night.

We had together several long and successful rambles along a narrow pathway which extended several miles into the forest. I here met with a new insect pest, one which the natives may be thankful is not spread more widely over the country: it was a large brown fly of the Tabanidæ family (genus Pangonia), with a proboscis half an inch long and sharper than the finest needle.

It settled on our backs by twos and threes at a time, and pricked us through our thick cotton shirts, making us start and cry out with the sudden pain. I secured a dozen or two as specimens. As an instance of the extremely confined ranges of certain species it may be mentioned that I did not find this insect in any other part of the country except along half a mile or so of this gloomy forest road.

We were amused at the excessive and almost absurd tameness of a fine Mutum or Curassow turkey that ran about the house. It was a large glossy-black species (the Mitu tuberosa) having an orange-coloured beak surmounted by a bean-shaped excrescence of the same hue. It seemed to consider itself as one of the family: attended at all the meals, passing from one person to another round the mat to be fed, and rubbing the sides of its head in a coaxing way against their cheeks or shoulders. At night it went to roost on a chest in a sleeping-room beside the hammock of one of the little girls, to whom it seemed particularly attached, following her wherever she went about the grounds. I found this kind of Curassow bird was very common in the forests of the Cuparí; but it is rare on the Upper Amazons, where an allied species which has a round instead of a bean-shaped waxen excrescence on the beak (Crax globicera) is the prevailing kind. These birds in their natural state never descend from the tops of the loftiest trees, where they live in small flocks and build their nests. The Mitu tuberosa lays two rough-shelled, white eggs; it is fully as large a bird as the common turkey, but the flesh when cooked

is drier and not so well flavoured. It is difficult to find the reason why these superb birds have not been reduced to domestication by the Indians, seeing that they so readily become tame. The obstacle offered by their not breeding in confinement, which is probably owing to their arboreal habits, might perhaps be overcome by repeated experiment; but for this the Indians probably had not sufficient patience or intelligence. The reason cannot lie in their insensibility to the value of such birds, for the common turkey, which has been introduced into the country, is much prized by them.

We had an unwelcome visitor whilst at anchor in the port of Joaõ Malagueita. I was awoke a little after midnight as I lay in my little cabin by a heavy blow struck at the sides of the canoe close to my head, which was succeeded by the sound of a weighty body plunging in the water. I got up; but all was again quiet, except the cackle of fowls in our hen-coop, which hung over the sides of the vessel about three feet from the cabin door. I could find no explanation of the circumstance, and, my men being all ashore, I turned in again and slept till morning. I then found my poultry loose about the canoe, and a large rent in the bottom of the hen-coop, which was about two feet from the surface of the water: a couple of fowls were missing. Senhor Antonio said the depredator was a Sucurujú (the Indian name for the Anacondà, or great water serpent—Eunectes murinus), which had for months past been haunting this part of the river, and had carried off many ducks and fowls from the ports of various

houses. I was inclined to doubt the fact of a serpent striking at its prey from the water, and thought an alligator more likely to be the culprit, although we had not yet met with alligators in the river. Some days afterwards the young men belonging to the different sitios agreed together to go in search of the serpent. They began in a systematic manner, forming two parties each embarked in three or four canoes, and starting from points several miles apart, whence they gradually approximated, searching all the little inlets on both sides the river. The reptile was found at last sunning itself on a log at the mouth of a muddy rivulet, and despatched with harpoons. I saw it the day after it was killed: it was not a very large specimen, measuring only eighteen feet nine inches in length and sixteen inches in circumference at the widest part of the body. I measured skins of the Anaconda afterwards, twenty-one feet in length and two feet in girth. The reptile has a most hideous appearance, owing to its being very broad in the middle and tapering abruptly at both ends. It is very abundant in some parts of the country; nowhere more so than in the Lago Grande, near Santarem, where it is often seen coiled up in the corners of farm-yards, and detested for its habit of carrying off poultry, young calves, or whatever animal it can get within reach of.

At Ega a large Anaconda was once near making a meal of a young lad about ten years of age belonging to one of my neighbours. The father and his son went one day in their montaria a few miles up the Teffé to gather wild fruit; landing on a sloping sandy shore,

where the boy was left to mind the canoe whilst the man entered the forest. The beaches of the Teffé form groves of wild guava and myrtle trees, and during most months of the year are partly overflown by the river. Whilst the boy was playing in the water under the shade of these trees a huge reptile of this species stealthily wound its coils around him, unperceived until it was too late to escape. His cries brought the father quickly to the rescue ; who rushed forward, and seizing the Anaconda boldly by the head, tore his jaws asunder. There appears to be no doubt that this formidable serpent grows to an enormous bulk and lives to a great age, for I heard of specimens having been killed which measured forty-two feet in length, or double the size of the largest I had an opportunity of examining. The natives of the Amazons country universally believe in the existence of a monster water-serpent said to be many score fathoms in length, which appears successively in different parts of the river. They call it the Mai d'agoa—the mother or spirit of the water. This fable, which was doubtless suggested by the occasional appearance of Sucurujús of unusually large size, takes a great variety of forms, and the wild legends form the subject of conversation amongst old and young, over the wood fires in lonely settlements.

*August 6th and 7th.*—On leaving the sitio of Antonio Malagueita we continued our way along the windings of the river, generally in a south-east and south-south-east direction but sometimes due south, for about fifteen miles, when we stopped at the house of one Paulo Christo, a mameluco whose acquaintance I had made at Aveyros.

Here we spent the night and part of the next day; doing in the morning a good five hours' work in the forest, accompanied by the owner of the place. In the afternoon of the 7th we were again under way: the river makes a bend to the east-north-east for a short distance above Paulo Christo's establishment, it then turns abruptly to the south-west, running from that direction about four miles. The hilly country of the interior then commences: the first token of it being a magnificently-wooded bluff rising nearly straight from the water to a height of about 250 feet. The breadth of the stream hereabout was not more than sixty yards, and the forest assumed a new appearance from the abundance of the Urucurí palm, a species which has a noble crown of broad fronds with symmetrical rigid leaflets.

On the road, we passed a little shady inlet, at the mouth of which a white-haired, wrinkle-faced old man was housed in a temporary shed, washing the soil for gold. He was quite alone: no one knew anything of him in these parts, except that he was a Cuyabano, or native of Cuyabá in the mining districts, and his little boat was moored close to his rude shelter. Whatever success he might have had remained a secret, for he went away, after a three weeks' stay in the place, without communicating with any one.

We reached, in the evening, the house of the last civilised settler on the river, Senhor Joaõ Aracú, a wiry, active fellow and capital hunter, whom I wished to make a friend of and persuade to accompany me to the Mundurucú village and the falls of the Cuparí, some forty miles further up the river.

I stayed at the sitio of Joaõ Aracú until the 19th, and again, in descending, spent fourteen days at the same place. The situation was most favourable for collecting the natural products of the district. The forest was not crowded with underwood, and pathways led through it for many miles and in various directions. I could make no use here of our two men as hunters, so, to keep them employed whilst José and I worked daily in the woods, I set them to make a montaria under Joaõ Aracú's directions. The first day a suitable tree was found for the shell of the boat, of the kind called Itaüba amarello, the yellow variety of the stone-wood. They felled it, and shaped out of the trunk a log nineteen feet in length: this they dragged from the forest, with the help of my host's men, over a road they had previously made with pieces of round wood to act as rollers. The distance was about half a mile, and the ropes used for drawing the heavy load were tough lianas cut from the surrounding trees. This part of the work occupied about a week: the log had then to be hollowed out, which was done with strong chisels through a slit made down the whole length. The heavy portion of the task being then completed, nothing remained but to widen the opening, fit two planks for the sides and the same number of semicircular boards for the ends, make the benches, and caulk the seams.

The expanding of the log thus hollowed out is a critical operation, and not always successful, many a good shell being spoilt by its splitting or expanding irregularly. It is first reared on tressels, with the slit downwards, over a large fire, which is kept up for seven or

eight hours, the process requiring unremitting attention to avoid cracks and make the plank bend with the proper dip at the two ends. Wooden straddlers, made by cleaving pieces of tough elastic wood and fixing them with wedges, are inserted into the opening, their compass being altered gradually as the work goes on, but in different degree according to the part of the boat operated upon. Our casca turned out a good one : it took a long time to cool, and was kept in shape whilst it did so by means of wooden cross-pieces. When the boat was finished it was launched with great merriment by the men, who hoisted coloured handkerchiefs for flags, and paddled it up and down the stream to try its capabilities. My people had suffered as much inconvenience from the want of a montaria as myself, so this was a day of rejoicing to all of us.

I was very successful at this place with regard to the objects of my journey. About twenty new species of fishes and a considerable number of small reptiles were added to my collection ; but very few birds were met with worth preserving. A great number of the most conspicuous insects of the locality were new to me, and turned out to be species peculiar to this part of the Amazons valley. There is the most striking contrast between the productions of the Cuparí and those of Altar do Chaõ in this department : the majority of the species inhabiting the one district being totally unknown in the other. At the same time a considerable proportion of the Cuparí species were identical with those of Ega on the Upper Amazons, a region eight times further removed than the village just mentioned. The

most interesting acquisition at this place was a large and handsome monkey, of a species I had not before met with—the white-whiskered Coaitá, or spider monkey, Ateles marginatus. I saw a pair one day in the forest moving slowly along the branches of a lofty tree, and shot one of them; the next day Joao Aracú brought down another, possibly the companion. The species is of about the same size as the common black kind of which I have given an account in a former chapter, and has a similar lean body with limbs clothed with coarse black hair; but it differs in having the whiskers and a triangular patch on the crown of the head of a white colour. It is never met with in the alluvial plains of the Amazons, nor, I believe, on the northern side of the great river valley, except towards the head waters, near the Andes; where Humboldt discovered it on the banks of the Santiago. I thought the meat the best flavoured I had ever tasted. It resembled beef, but had a richer and sweeter taste. During the time of our stay in this part of the Cuparí, we could get scarcely anything but fish to eat, and as this diet ill agreed with me, three successive days of it reducing me to a state of great weakness, I was obliged to make the most of our Coaitá meat. We smoke-dried the joints instead of salting them; placing them for several hours on a framework of sticks arranged over a fire, a plan adopted by the natives to preserve fish when they have no salt, and which they call "muquiar." Meat putrefies in this climate in less than twenty-four hours, and salting is of no use, unless the pieces are cut in thin slices and dried immediately in the sun. My monkeys lasted me about

a fortnight, the last joint being an arm with the clenched fist, which I used with great economy, hanging it in the intervals between my frugal meals on a nail in the cabin. Nothing but the hardest necessity could have driven me so near to cannibalism as this, but we had the greatest difficulty in obtaining here a sufficient supply of animal food. About every three days the work on the montaria had to be suspended and all hands turned out for the day to hunt and fish, in which they were often unsuccessful, for although there was plenty of game in the forest, it was too widely scattered to be available. Ricardo and Alberto occasionally brought in a tortoise or an anteater, which served us for one day's consumption. We made acquaintance here with many strange dishes, amongst them Iguana eggs; these are of oblong form, about an inch in length, and covered with a flexible shell. The lizard lays about two score of them in the hollows of trees. They have an oily taste; the men ate them raw, beaten up with farinha, mixing a pinch of salt in the mess; I could only do with them when mixed with Tucupí sauce, of which we had a large jar full always ready to temper unsavoury morsels.

One day as I was entomologizing alone and unarmed, in a dry Ygapó, where the trees were rather wide apart and the ground coated to the depth of eight or ten inches with dead leaves, I was near coming into collision with a boa constrictor. I had just entered a little thicket to capture an insect, and whilst pinning it was rather startled by a rushing noise in the vicinity. I looked up to the sky, thinking a squall was coming on, but not a breath of wind stirred in the tree-tops. On

stepping out of the bushes I met face to face a huge serpent coming down a slope, and making the dry twigs crack and fly with his weight as he moved over them. I had very frequently met with a smaller boa, the Cutim-boia, in a similar way, and knew from the habits of the family that there was no danger, so I stood my ground. On seeing me the reptile suddenly turned, and glided at an accelerated pace down the path. Wishing to take a note of his probable size and the colours and markings of his skin, I set off after him; but he increased his speed, and I was unable to get near enough for the purpose. There was very little of the serpentine movement in his course. The rapidly moving and shining body looked like a stream of brown liquid flowing over the thick bed of fallen leaves, rather than a serpent with skin of varied colours. He descended towards the lower and moister parts of the Ygapó. The huge trunk of an uprooted tree here lay across the road; this he glided over in his undeviating course, and soon after penetrated a dense swampy thicket, where of course I did not choose to follow him.

I suffered terribly from the heat and mosquitoes as the river sank with the increasing dryness of the season, although I made an awning of the sails to work under, and slept at night in the open air with my hammock slung between the masts. But there was no rest in any part; the canoe descended deeper and deeper into the gulley, through which the river flows between high clayey banks, as the water subsided, and with the glowing sun overhead we felt at midday as if in a furnace. I could bear scarcely any clothes in the daytime between eleven

in the morning and five in the afternoon, wearing nothing but loose and thin cotton trousers and a light straw hat, and could not be accommodated in Joaõ Aracú's house, as it was a small one and full of noisy children. One night we had a terrific storm. The heat in the afternoon had been greater than ever, and at sunset the sky had a brassy glare: the black patches of cloud which floated in it, being lighted up now and then by flashes of sheet lightning. The mosquitoes at night were more than usually troublesome, and I had just sunk exhausted into a doze towards the early hours of morning when the storm began; a complete deluge of rain with incessant lightning and rattling explosions of thunder. It lasted for eight hours; the grey dawn opening amidst the crash of the tempest. The rain trickled through the seams of the cabin roof on to my collections, the late hot weather having warped the boards, and it gave me immense trouble to secure them in the midst of the confusion. Altogether I had a bad night of it, but what with storms, heat, mosquitoes, hunger, and, towards the last, ill health, I seldom had a good night's rest on the Cuparí.

A small creek traversed the forest behind Joaõ Aracú's house, and entered the river a few yards from our anchoring place. I used to cross it twice a day, on going and returning from my hunting ground. One day early in September, I noticed that the water was two or three inches higher in the afternoon than it had been in the morning. This phenomenon was repeated the next day, and in fact daily, until the

creek became dry with the continued subsidence of the Cuparí, the time of rising shifting a little from day to day. I pointed out the circumstance to Joaõ Aracú, who had not noticed it before (it was only his second year of residence in the locality), but agreed with me that it must be the "maré." Yes, the tide! the throb of the great oceanic pulse felt in this remote corner, 530 miles distant from the place where it first strikes the body of fresh water at the mouth of the Amazons. I hesitated at first at this conclusion, but on reflecting that the tide was known to be perceptible at Obydos, more than 400 miles from the sea; that at high water in the dry season a large flood from the Amazons enters the mouth of the Tapajos, and that there is but a very small difference of level between that point and the Cuparí, a fact shown by the absence of current in the dry season; I could have no doubt that this conclusion was a correct one.

The fact of the tide being felt 530 miles up the Amazons, passing from the main stream to one of its affluents 380 miles from its mouth, and thence to a branch in the third degree, is a proof of the extreme flatness of the land which forms the lower part of the Amazonian valley. This uniformity of level is shown also in the broad lake-like expanses of water formed near their mouths by the principal affluents which cross the valley to join the main river.

*August* 21*st*.—Joaõ Aracú consented to accompany me to the falls with one of his men, to hunt and fish for me. One of my objects was to obtain specimens of the hyacinthine macaw, whose range commences on all

the branch rivers of the Amazons which flow from the south through the interior of Brazil, with the first cataracts. We started on the 19th ; our direction on that day being generally south-west. On the 20th our course was southerly and south-easterly. This morning (August 21st) we arrived at the Indian settlement, the first house of which lies about thirty-one miles above the sitio of Joaõ Aracú. The river at this place is from sixty to seventy yards wide, and runs in a zigzag course between steep clayey banks twenty to fifty feet in height. The houses of the Mundurucús to the number of about thirty are scattered along the banks for a distance of six or seven miles. The owners appear to have chosen all the most picturesque sites—tracts of level ground at the foot of wooded heights, or little havens with bits of white sandy beach—as if they had an appreciation of natural beauty. Most of the dwellings are conical huts, with walls of framework filled in with mud and thatched with palm leaves, the broad eaves reaching halfway to the ground. Some are quadrangular, and do not differ in structure from those of the semi-civilised settlers in other parts ; others are open sheds or ranchos. They seem generally to contain not more than one or two families each.

At the first house we learnt that all the fighting men had this morning returned from a two days' pursuit of a wandering horde of savages of the Paráraúate tribe, who had strayed this way from the interior lands and robbed the plantations. A little further on we came to the house of the Tushaúa or chief, situated on the top of a high bank, which we had to ascend by

wooden steps. There were four other houses in the neighbourhood, all filled with people. A fine old fellow, with face, shoulders, and breast tattooed all over in a cross-bar pattern, was the first strange object that caught my eye. Most of the men lay lounging or sleeping in their hammocks. The women were employed in an adjoining shed making farinha, many of them being quite naked, and rushing off to the huts to slip on their petticoats when they caught sight of us. Our entrance aroused the Tushaúa from a nap; after rubbing his eyes he came forward and bade us welcome with the most formal politeness, and in very good Portuguese. He was a tall, broad-shouldered, well-made man, apparently about thirty years of age, with handsome regular features, not tattooed, and a quiet good-humoured expression of countenance. He had been several times to Santarem and once to Pará, learning the Portuguese language during these journeys. He was dressed in shirt and trousers made of blue-checked cotton cloth and there was not the slightest trace of the savage in his appearance or demeanour. I was told that he had come into the chieftainship by inheritance, and that the Cuparí horde of Mundurucús, over which his fathers had ruled before him, was formerly much more numerous, furnishing 300 bows in time of war. They could now scarcely muster forty; but the horde has no longer a close political connection with the main body of the tribe, which inhabits the banks of the Tapajos, six days' journey from the Cuparí settlement.

I spent the remainder of the day here, sending Aracú and the men to fish, whilst I amused myself with the

Tushaúa and his people. A few words served to explain my errand on the river; he comprehended at once why white men should admire and travel to collect the beautiful birds and animals of his country, and neither he nor his people spoke a single word about trading, or gave us any trouble by coveting the things we had brought. He related to me the events of the preceding three days. The Paráraúates were a tribe of intractable savages with whom the Mundurucús have been always at war. They had no fixed abode, and of course made no plantations, but passed their lives like the wild beasts, roaming through the forest, guided by the sun: wherever they found themselves at night-time there they slept, slinging their bast hammocks, which are carried by the women, to the trees. They ranged over the whole of the interior country, from the head waters of the Itapacurá (a branch of the Tapajos flowing from the east, whose sources lie in about 7° south latitude) to the banks of the Curuá (about 3° south latitude), and from the Mundurucú settlements on the Tapajos (55° west longtitude) to the Pacajaz (50° west longitude). They cross the streams which lie in their course in bark canoes, which they make on reaching the water, and cast away after landing on the opposite side. The tribe is very numerous, but the different hordes obey only their own chieftains. The Mundurucús of the upper Tapajos have an expedition on foot against them at the present time, and the Tushaúa supposed that the horde which had just been chased from his maloca were fugitives from that direction. There were about a hundred of them—including men, women, and chil-

dren. Before they were discovered the hungry savages had uprooted all the macasheira, sweet potatoes, and sugar cane, which the industrious Mundurucús had planted for the season, on the east side of the river. As soon as they were seen they made off, but the Tushaúa quickly got together all the young men of the settlement, about thirty in number, who armed themselves with guns, bows and arrows, and javelins, and started in pursuit. They tracked them, as before related, for two days through the forest, but lost their traces on the further bank of the Cuparitinga, a branch stream flowing from the north-east. The pursuers thought, at one time, they were close upon them, having found the inextinguished fire of their last encampment. The footmarks of the chief could be distinguished from the rest by their great size and the length of the stride. A small necklace made of scarlet beans was the only trophy of the expedition, and this the Tushaúa gave to me.

I saw very little of the other male Indians, as they were asleep in their huts all the afternoon. There were two other tattooed men lying under an open shed, besides the old man already mentioned. One of them presented a strange appearance, having a semicircular black patch in the middle of his face, covering the bottom of the nose and mouth, crossed lines on his back and breast, and stripes down his arms and legs. It is singular that the graceful curved patterns used by the South Sea Islanders, are quite unknown among the Brazilian red men; they being all tattooed either in simple lines or patches. The nearest approach to elegance of

design which I saw, was amongst the Tucúnas of the Upper Amazons, some of whom have a scroll-like mark on each cheek, proceeding from the corner of the mouth. The taste, as far as form is concerned, of the American Indian would seem to be far less refined than that of the Tahitian and New Zealander.

To amuse the Tushaúa, I fetched from the canoe the two volumes of Knight's Pictorial Museum of Animated Nature. The engravings quite took his fancy, and he called his wives, of whom, as I afterwards learnt from Aracú, he had three or four, to look at them ; one of them was a handsome girl, decorated with necklace and bracelets of blue beads. In a short time others left their work, and I then had a crowd of women and children around me, who all displayed unusual curiosity for Indians. It was no light task to go through the whole of the illustrations, but they would not allow me to miss a page, making me turn back when I tried to skip. The pictures of the elephant, camels, orang-otangs, and tigers, seemed most to astonish them ; but they were interested in almost everything, down even to the shells and insects. They recognised the portraits of the most striking birds and mammals which are found in their own country ; the jaguar, howling monkeys, parrots, trogons, and toucans. The elephant was settled to be a large kind of Tapir ; but they made but few remarks, and those in the Mundurucú language, of which I understood only two or three words. Their way of expressing surprise was a clicking sound made with the teeth, similar to the one we ourselves use, or a subdued ex-

clamation, Hm ! hm ! Before I finished, from fifty to sixty had assembled ; there was no pushing or rudeness, the grown-up women letting the young girls and children stand before them, and all behaved in the most quiet and orderly manner possible.

The great difference in figure, shape of head, and arrangement of features amongst these people struck me forcibly, and showed how little uniformity there is in these respects amongst the Brazilian Indians, even when belonging to the same tribe. The only points in which they all closely resembled each other were the long, thick, straight, jet-black hair, the warm coppery-brown tint of the skin, and the quiet, rather dull, expression of countenance. I saw no countenance so debased in expression as many seen amongst the Múra tribe, and no head of the Mongolian type—broad, with high cheek bones, and oblique position of the eyes—of which single examples occur amongst the semi-civilised canoemen on the river. Many of them had fine oval faces, with rather long and well-formed features, moderately thin lips, and arched forehead. One little girl, about twelve years of age, had quite a European cast of features, and a remarkably slim figure. They were all clean in their persons ; the petticoats of the women being made of coarse cotton cloth obtained from traders, and their hair secured in a knot behind by combs made of pieces of bamboo. The old men had their heads closely cropped, with the exception of a long fringe which hung down in front over their foreheads.

The Mundurucús are perhaps the most numerous

and formidable tribe of Indians now surviving in the Amazons region. They inhabit the shores of the Tapajos (chiefly the right bank), from 3° to 7° south latitude, and the interior of the country between that part of the river and the Madeira. On the Tapajos alone they can muster, I was told, 2000 fighting men; the total population of the tribe may be about 20,000. They were not heard of until about ninety years ago, when they made war on the Portuguese settlements; their hosts crossing the interior of the country eastward of the Tapajos, and attacking the establishments of the whites in the province of Maranham. The Portuguese made peace with them in the beginning of the present century, the event being brought about by the common cause of quarrel entertained by the two peoples against the hated Múras. They have ever since been firm friends of the whites. It is remarkable how faithfully this friendly feeling has been handed down amongst the Mundurucús, and spread to the remotest of the scattered hordes. Wherever a white man meets a family, or even an individual of the tribe, he is almost sure to be reminded of this alliance. They are the most warlike of the Brazilian tribes, and are considered also the most settled and industrious; they are not, however, superior in this latter respect to the Jurís and Passés on the Upper Amazons, or the Uapés Indians near the head waters of the Rio Negro. They make very large plantations of mandioca, and sell the surplus produce, which amounts on the Tapajos to from 3000 to 5000 baskets (60 lbs. each) annually, to traders who ascend the river from Santarem between the months

of August and January. They also gather large quantities of salsaparilla, India-rubber, and Tonka beans, in the forests. The traders, on their arrival at the Campinas (the scantily wooded region inhabited by the main body of Mundurucús beyond the cataracts) have first to distribute their wares—cheap cotton cloths, iron hatchets, cutlery, small wares, and cashaça—amongst the minor chiefs, and then wait three or four months for repayment in produce.

A rapid change is taking place in the habits of these Indians through frequent intercourse with the whites, and those who dwell on the banks of the Tapajos now seldom tattoo their children. The principal Tushaúa of the whole tribe or nation, named Joaquim, was rewarded with a commission in the Brazilian army, in acknowledgment of the assistance he gave to the legal authorities during the rebellion of 1835-6. It would be a misnomer to call the Mundurucús of the Cuparí and many parts of the Tapajos, savages ; their regular mode of life, agricultural habits, loyalty to their chiefs, fidelity to treaties, and gentleness of demeanour, give them a right to a better title. Yet they show no aptitude for the civilised life of towns, and, like the rest of the Brazilian tribes, seem incapable of any further advance in culture. In their former wars they exterminated two of the neighbouring peoples, the Júmas and the Jacarés ; and make now an annual expedition against the Parárauátes, and one or two other similar wild tribes who inhabit the interior of the land, but are sometimes driven by hunger towards the banks of the great rivers to rob the plantations of the agricul-

tural Indians. These campaigns begin in July, and last throughout the dry months; the women generally accompanying the warriors to carry their arrows and javelins. They had the diabolical custom, in former days, of cutting off the heads of their slain enemies, and preserving them as trophies around their houses. I believe this, together with other savage practices, has been relinquished in those parts where they have had long intercourse with the Brazilians, for I could neither see nor hear anything of these preserved heads. They used to sever the head with knives made of broad bamboo, and then, after taking out the brain and fleshy parts, soak it in bitter vegetable oil (andiroba), and expose it for several days over the smoke of a fire or in the sun. In the tract of country between the Tapajos and the Madeira, a deadly war has been for many years carried on between the Mundurucús and the Aráras. I was told by a Frenchman at Santarem, who had visited that part, that all the settlements there have a military organization. A separate shed is built outside of each village, where the fighting men sleep at night, sentinels being stationed to give the alarm with blasts of the Turé on the approach of the Aráras, who choose the night for their onslaughts.

Each horde of Mundurucús has its pajé or medicine man, who is the priest and doctor; fixes upon the time most propitious for attacking the enemy; exorcises evil spirits, and professes to cure the sick. All illness whose origin is not very apparent is supposed to be caused by a worm in the part affected. This the pajé pretends to extract; he blows on the seat of pain the smoke from

a large cigar, made with an air of great mystery by rolling tobacco in folds of Tauarí, and then sucks the place, drawing from his mouth, when he has finished, what he pretends to be the worm. It is a piece of very clumsy conjuring. One of these pajés was sent for by a woman in Joaõ Malagueita's family, to operate on a child who suffered much from pains in the head. Senhor Joaõ contrived to get possession of the supposed worm after the trick was performed in our presence, and it turned out to be a long white air-root of some plant. The pajé was with difficulty persuaded to operate whilst Senhor Joaõ and I were present. I cannot help thinking that he, as well as all others of the same profession, are conscious impostors, handing down the shallow secret of their divinations and tricks from generation to generation. The institution seems to be common to all tribes of Indians, and to be held to more tenaciously than any other.

The opposite (western) shore of the Tapajos for some distance beyond the falls, and the country thence to the channels behind Villa Nova, are inhabited by the Mauhés tribe, of whom I have spoken in a former chapter. These are also a settled, agricultural people, but speak a totally different language from that of the Mundurucús. I saw at Aveyros several men of this fine tribe, who were descending the river in a trading canoe, and who, on being confronted with a Mundurucú were quite unable to understand him. There are many other points of difference between the two tribes. The Mauhés are much less warlike, and do not practise tattooing. Their villages are composed of a number of small huts, tenanted by

single families, whilst the separate hordes of Mundurucús generally live together, each in one large dwelling. The Cuparí horde do not form an exception in this respect, as they also lived together in one of these large huts until very recently. The Mauhés are undistinguishable in physical appearance from their neighbours, being of middle size, with broad muscular chests, and well-shaped limbs and hands. But the individuals of both tribes can be readily distinguished from the Múras; less, however, by the structure and proportions of the body than by the expression of their countenances, which is mild and open instead of brutal, surly and mistrustful, as in those savages. They are invariably friendly to the whites; as I have already mentioned, they use the Paricá snuff, a habit quite unknown to the Mundurucús. They are the only tribe who manufacture Guaraná, a hard substance made of the pounded seeds of a climbing plant (Paullinia sorbilis), which they sell in large quantities to traders, it being used throughout the whole of the interior provinces of Brazil, grated and mixed in water, as a remedy in diarrhœa and intermittent fevers. The Mundurucús have a tradition that they and the Mauhés originally formed one tribe; the two peoples were formerly bitter enemies, but are now, and have been for many years, at peace with each other. Many centuries must have elapsed since the date of their first separation, to have produced the great differences now existing in language and customs between the two tribes. I fancy the so-called tradition is only a myth, but it doubtless conveys the truth. The points of resemblance between all the tribes inhabiting the region

of the Amazons are so numerous and striking, that, notwithstanding the equally striking points of difference which some of them exhibit, we must conclude that not only the Mundurucús and Mauhés, but all the various peoples had a common origin—that is, they are derived by immigration from one quarter and one stock, the separate tribes subsequently acquiring their peculiarities by long isolation.

I bought of the Tushaúa two beautiful feather sceptres, with their bamboo cases. These are of cylindrical shape, about three feet in length and three inches in diameter, and are made by gluing with wax the fine white and yellow feathers from the breast of the toucan on stout rods, the tops being ornamented with long plumes from the tails of parrots, trogons, and other birds. The Mundurucús are considered to be the most expert workers in feathers of all the South American tribes. It is very difficult, however, to get them to part with the articles, as they seem to have a sort of superstitious regard for them. They manufacture headdresses, sashes and tunics, besides sceptres; the feathers being assorted with a good eye to the proper contrast of colours, and the quills worked into strong cotton webs, woven with knitting sticks in the required shape. The dresses are worn only during their festivals, which are celebrated, not at stated times, but whenever the Tushaúa thinks fit. Dancing, singing, sports, and drinking, appear to be the sole objects of these occasional holidays. When a day is fixed upon, the women prepare a great quantity of tarobá, and the monotonous jingle is kept up, with little intermission

night and day until the stimulating beverage is finished.

We left the Tushaúa's house early the next morning. The impression made upon me by the glimpse of Indian life in its natural state obtained here, and at another cluster of houses visited higher up, was a pleasant one, notwithstanding the disagreeable incident of the Pará-rauáte visit. The Indians are here seen to the best advantage; having relinquished many of their most barbarous practices, without being corrupted by too close contact with the inferior whites and half-breeds of the civilised settlements. The manners are simpler, the demeanour more gentle, cheerful and frank, than amongst the Indians who live near the towns. I could not help contrasting their well-fed condition, and the signs of orderly, industrious habits, with the poverty and laziness of the semi-civilised people of Altar do Chaõ. I do not think that the introduction of liquors has been the cause of much harm to the Brazilian Indian. He has his drinking bout now and then, like the common working people of other countries. It was his habit in his original state, before Europeans visited his country; but he is always ashamed of it afterwards, and remains sober during the pretty long intervals. The harsh, slave-driving practices of the Portuguese and their descendants have been the greatest curses to the Indians; the Mundurucús of the Cuparí, however, have been now for many years protected against ill-treatment. This is one of the good services rendered by the missionaries, who take care that the Brazilian laws in favour of the aborigines shall be respected by the brutal

and unprincipled traders who go amongst them. I think no Indians could be in a happier position than these simple, peaceful and friendly people on the banks of the Cuparí. The members of each family live together, and seem to be much attached to each other; and the authority of the chief is exercised in the mildest manner. Perpetual summer reigns around them; the land is of the highest fertility, and a moderate amount of light work produces them all the necessaries of their simple life. It is difficult to get at their notions on subjects that require a little abstract thought; but the mind of the Indian is in a very primitive condition. I believe he thinks of nothing except the matters that immediately concern his daily material wants. There is an almost total absence of curiosity in his mental disposition, consequently he troubles himself very little concerning the causes of the natural phenomena around him. He has no idea of a Supreme Being; but, at the same time, he is free from revolting superstitions—his religious notions going no farther than the belief in an evil spirit, regarded merely as a kind of hobgoblin, who is at the bottom of all his little failures, troubles in fishing, hunting, and so forth. With so little mental activity, and with feelings and passions slow of excitement, the life of these people is naturally monotonous and dull, and their virtues are, properly speaking, only negative; but the picture of harmless homely contentment they exhibit is very pleasing, compared with the state of savage races in many other parts of the world.

The men awoke me at four o'clock with the sound of

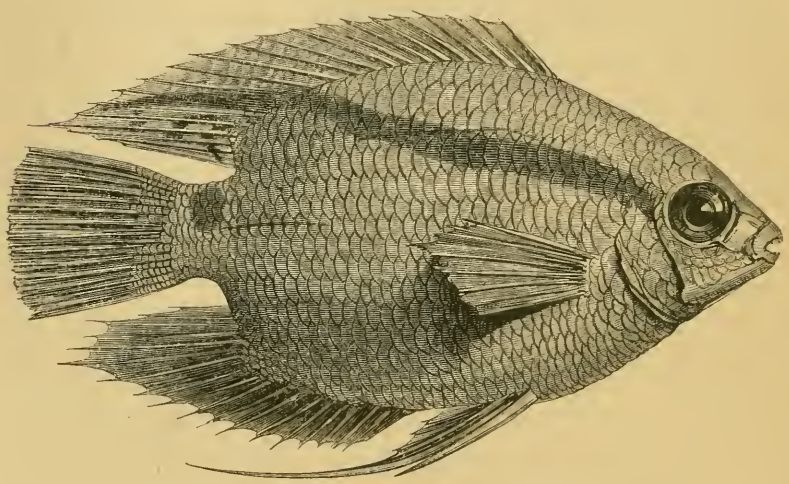
their oars on leaving the port of the Tushaúa. I was surprised to find a dense fog veiling all surrounding objects, and the air quite cold. The lofty wall of forest, with the beautiful crowns of Assai palms standing out from it on their slender, arching stems, looked dim and strange through the misty curtain. The sudden change a little after sunrise had quite a magical effect, for the mist rose up like the gauze veil before the transformation scene at a pantomime, and showed the glorious foliage in the bright glow of morning, glittering with dew-drops. We arrived at the falls about ten o'clock. The river here is not more than forty yards broad, and falls over a low ledge of rock stretching in a nearly straight line across.

We had now arrived at the end of the navigation for large vessels—a distance from the mouth of the river, according to a rough calculation, of a little over seventy miles. I found it the better course now to send José and one of the men forward in the montaria with Joaõ Aracú, and remain myself with the cuberta and our other man, to collect in the neighbouring forest. We stayed here four days; one of the boats returning each evening from the upper river with the produce of the day's chase of my huntsmen. I obtained six good specimens of the hyacinthine macaw, besides a number of smaller birds, a species new to me of Guaríba, or howling monkey, and two large lizards. The Guaríba was an old male, with the hair much worn from his rump and breast, and his body disfigured with large tumours made by the grubs of a gad-fly (Œstrus). The back and tail were of a ruddy-brown colour; the limbs and under-

side of the body, black. The men ascended to the second falls, which form a cataract several feet in height, about fifteen miles beyond our anchorage. The macaws were found feeding in small flocks on the fruit of the Tucumá palm (Astryocaryum Tucumá), the excessively hard nut of which is crushed into pulp by the powerful beak of the bird. I found the craws of all the specimens filled with the sour paste to which the stone-like fruit had been reduced. Each bird took me three hours to skin, and I was occupied with these and my other specimens every evening until midnight, after my own laborious day's hunt; working on the roof of my cabin by the light of a lamp.

The place where the cuberta was anchored formed a little rocky haven, with a sandy beach sloping to the forest, within which were the ruins of the Indian Maloca, and a large weed-grown plantation. The port swarmed with fishes, whose movements it was amusing to watch in the deep, clear water. The most abundant were the Piránhas. One species, which varied in length, according to age, from two to six inches, but was recognisable by a black spot at the root of the tail, was always the quickest to seize any fragment of meat thrown into the water. When nothing was being given to them, a few only were seen scattered about, their heads all turned one way in an attitude of expectation; but as soon as any offal fell from the canoe, the water was blackened with the shoals that rushed instantaneously to the spot. Those who did not succeed in securing a fragment, fought with those who had been more successful, and many contrived to steal the coveted morsels

from their mouths. When a bee or fly passed through the air near the water, they all simultaneously darted towards it as if roused by an electric shock. Sometimes a larger fish approached, and then the host of Piránhas took the alarm and flashed out of sight. The population of the water varied from day to day. Once a small shoal of a handsome black-banded fish, called by the



Acará (Mesonauta insignis).

natives Acará bandeira (Mesonauta insignis, of Günther), came gliding through at a slow pace, forming a very pretty sight. At another time, little troops of needle fish, eel-like animals, with excessively long and slender toothed jaws, sailed through the field, scattering before them the hosts of smaller fry ; and in the rear of the needle-fishes a strangely-shaped kind called Sarapó came wriggling along, one by one, with a slow movement. We caught with hook and line, baited with pieces of banana, several Curimatá (Anodus Ama-

zonum), a most delicious fish, which, next to the Tucunaré and the Pescada, is most esteemed by the natives. The Curimatá seemed to prefer the middle of the stream, where the waters were agitated beneath the little cascade.

The weather was now settled and dry, and the river sank rapidly—six inches in twenty-four hours. In this remote and solitary spot I can say that I heard for the first and almost the only time the uproar of life at sunset, which Humboldt describes as having witnessed towards the sources of the Orinoco, but which is unknown on the banks of the larger rivers. The noises of animals began just as the sun sank behind the trees after a sweltering afternoon, leaving the sky above of the intensest shade of blue. Two flocks of howling monkeys, one close to our canoe, the other about a furlong distant, filled the echoing forests with their dismal roaring. Troops of parrots, including the hyacinthine macaw we were

Sarapó (Carapus.)

Needle-fish (Hemaramphus).

in search of, began then to pass over; the different styles of cawing and screaming of the various species making a terrible discord. Added to these noises were the songs of strange Cicadas, one large kind perched high on the trees around our little haven setting up a most piercing chirp: it began with the usual harsh jarring tone of its tribe, but this gradually and rapidly became shriller, until it ended in a long and loud note resembling the steam-whistle of a locomotive engine. Half-a-dozen of these wonderful performers made a considerable item in the evening concert. I had heard the same species before at Pará, but it was there very uncommon: we obtained here one of them for my collection by a lucky blow with a stone. The uproar of beasts, birds, and insects lasted but a short time: the sky quickly lost its intense hue, and the night set in. Then began the tree-frogs—quack-quack, drum-drum, hoo-hoo; these, accompanied by a melancholy night-jar, kept up their monotonous cries until very late.

My men encountered on the banks of the stream a Jaguar and a black Tiger, and were very much afraid of falling in with the Parárauátes, so that I could not after their return on the fourth day, induce them to undertake another journey. We began our descent of the river in the evening of the 26th of August. At night forest and river were again enveloped in mist, and the air before sunrise was quite cold. There is a considerable current from the falls to the house of Joaõ Aracú, and we accomplished the distance, with its aid and by rowing, in seventeen hours.

*Sept.* 21*st.*—At five o'clock in the afternoon we emerged from the confined and stifling gully through which the Cuparí flows, into the broad Tapajos, and breathed freely again. How I enjoyed the extensive view after being so long pent up: the mountainous coasts, the gray distance, the dark waters tossed by a refreshing breeze! Heat, mosquitoes, insufficient and bad food, hard work and anxiety, had brought me to a very low state of health; and I was now anxious to make all speed back to Santarem.

We touched at Aveyros, to embark some chests I had left there and to settle accounts with Captain Antonio: finding nearly all the people sick with fever and vomit, against which the Padre's homœopathic globules were of no avail. The Tapajos had been pretty free from epidemics for some years past, although it was formerly a very unhealthy river. A sickly time appeared to be now returning: in fact, the year following my visit (1853) was the most fatal one ever experienced in this part of the country. A kind of putrid fever broke out, which attacked people of all races alike. The accounts we received at Santarem were most distressing: my Cuparí friends especially suffered very severely. Joaõ Aracú and his family all fell victims, with the exception of his wife: my kind friend Joaõ Malagueita also died, and a great number of people in the Mundurucú village.

The descent of the Tapajos in the height of the dry season, which was now close at hand, is very hazardous on account of the strong winds, absence of current, and shoaly water far away from the coasts. The river towards the end of September is about thirty feet shallower

than in June ; and in many places, ledges of rock are laid bare, or covered with only a small depth of water. I had been warned of these circumstances by my Cuparí friends, but did not form an adequate idea of what we should have to undergo. Canoes, in descending, only travel at night, when the terral, or light land-breeze, blows off the eastern shore. In the day-time a strong wind rages from down river, against which it is impossible to contend, as there is no current, and the swell raised by its sweeping over scores of miles of shallow water is dangerous to small vessels. The coast for the greater part of the distance affords no shelter : there are, however, a number of little harbours, called *esperas,* which the canoe-men calculate upon, carefully arranging each night-voyage so as to reach one of them before the wind begins the next morning.

We left Aveyros in the evening of the 21st, and sailed gently down with the soft land-breeze, keeping about a mile from the eastern shore. It was a brilliant moonlit night, and the men worked cheerfully at the oars, when the wind was slack ; the terral wafting from the forest a pleasant perfume like that of mignonette. At midnight we made a fire and got a cup of coffee, and at three o'clock in the morning reached the sitio of Ricardo's father, an Indian named André, where we anchored and slept.

*Sept.* 22*nd.*—Old André with his squaw came aboard this morning. They brought three Tracajás, a turtle, and a basketful of Tracajá eggs, to exchange with me for cotton cloth and cashaça. Ricardo, who had been for some time very discontented, having now satisfied his long-

ing to see his parents cheerfully agreed to accompany me to Santarem. The loss of a man at this juncture would have been very annoying, with Captain Antonio ill at Aveyros, and not a hand to be had anywhere in the neighbourhood; but if we had not called at André's sitio, we should not have been able to have kept Ricardo from running away at the first landing-place. He was a lively, restless lad, and although impudent and troublesome at first, had made a very good servant; his companion, Alberto, was of quite a different disposition, being extremely taciturn, and going through all his duties with the quietest regularity.

We left at 11 a.m., and progressed a little before the wind began to blow from down river, when we were obliged again to cast anchor. The terral began at six o'clock in the evening, and we sailed with it past the long line of rock-bound coast near Itapuáma. At ten o'clock a furious blast of wind came from a cleft between the hills, catching us with the sails close-hauled, and throwing the canoe nearly on its beam-ends, when we were about a mile from the shore. José had the presence of mind to slacken the sheet of the mainsail, whilst I leapt forward and lowered the sprit of the foresail; the two Indians standing stupified in the prow. It was what the canoemen call a *trovoada secca* or white squall. The river in a few minutes became a sheet of foam; the wind ceased in about half an hour, but the terral was over for the night, so we pulled towards the shore to find an anchoring place.

We reached Tapaiuna by midnight on the 23rd, and on the morning of the 24th arrived at the Retiro, where

we met a shrewd Santarem trader, whom I knew, Senhor Chico Honorio, who had a larger and much better provided canoe than our own. The wind was strong from below all day, so we remained at this place in his company. He had his wife with him, and a number of Indians, male and female. We slung our hammocks under the trees, and breakfasted and dined together, our cloth being spread on the sandy beach in the shade; after killing a large quantity of fish with *timbó*, of which we had obtained a supply at Itapuáma. At night we were again under way with the land breeze. The water was shoaly to a great distance off the coast, and our canoe having the lighter draught went ahead, our leadsman crying out the soundings to our companion: the depth was only one fathom, half a mile from the coast. We spent the next day (25th) at the mouth of a creek called Piní, which is exactly opposite the village of Boim, and on the following night advanced about twelve miles. Every point of land had a long spit of sand stretching one or two miles towards the middle of the river, which it was necessary to double by a wide circuit. The terral failed us at midnight when we were near an *espera*, called Maraï, the mouth of a shallow creek.

*Sept. 26th.*—I did not like the prospect of spending the whole dreary day at Maraï, where it was impossible to ramble ashore, the forest being utterly impervious, and the land still partly under water. Besides, we had used up our last stick of firewood to boil our coffee at sunrise, and could not get a fresh supply at this place. So there being a dead calm on the river in the morning,

I gave orders at ten o'clock to move out of the harbour, and try with the oars to reach Paquiatúba, which was only five miles distant. We had doubled the shoaly point which stretches from the mouth of the creek, and were making way merrily across the bay, at the head of which was the port of the little settlement, when we beheld to our dismay, a few miles down the river, the signs of the violent day breeze coming down upon us—a long, rapidly advancing line of foam with the darkened water behind it. Our men strove in vain to gain the harbour; the wind overtook us, and we cast anchor in three fathoms, with two miles of shoaly water between us and the land on our lee. It came with the force of a squall: the heavy billows washing over the vessel and drenching us with the spray. I did not expect that our anchor would hold; I gave out, however, plenty of cable and watched the result at the prow; José placing himself at the helm, and the men standing by the jib and foresail, so as to be ready, if we dragged, to attempt the passage of the Maraï spit, which was now almost dead to leeward. Our little bit of iron, however, held its place; the bottom being fortunately not so sandy as in most other parts of the coast; but our weak cable then began to cause us anxiety. We remained in this position all day without food, for everything was tossing about in the hold; provision-chests, baskets, kettles, and crockery. The breeze increased in strength towards the evening, when the sun set fiery red behind the misty hills on the western shore, and the gloom of the scene was heightened by the strange contrasts of colour; the inky water and the lurid gleam of the sky.

Heavy seas beat now and then against the prow of our vessel with a force that made her shiver. If we had gone ashore in this place, all my precious collections would have been inevitably lost ; but we ourselves could have scrambled easily to land, and re-embarked with Senhor Honorio, who had remained behind in the Piní, and would pass in the course of two or three days. When night came I lay down exhausted with watching and fatigue, and fell asleep, as my men had done some time before. About nine o'clock, I was awoke by the montaria bumping against the sides of the vessel, which had veered suddenly round, and the full moon, previously astern, then shone full in the cabin. The wind had abruptly ceased, giving place to light puffs from the eastern shore, and leaving a long swell rolling into the shoaly bay.

After this I resolved not to move a step beyond Paquiatúba without an additional man, and one who understood the navigation of the river at this season. We reached the landing-place at ten o'clock, and anchored within the mouth of the creek. In the morning I walked through the beautiful shady alleys of the forest, which were water-paths in June when we touched here in ascending the river, to the house of Inspector Cypriano. After an infinite deal of trouble I succeeded in persuading him to furnish me with another Indian. There are about thirty families established in this place, but the able-bodied men had been nearly all drafted off within the last few weeks by the Government, to accompany a military expedition against runaway negroes, settled in villages in the interior.

Senhor Cypriano was a pleasant-looking and extremely civil young Mameluco. He accompanied us, on the night of the 28th, five miles down the river to Point Jaguararí, where the man lived whom he intended to send with me. I was glad to find my new hand a steady, middle-aged, and married Indian; his name was of very good promise, Angelo Custodio (Guardian Angel).

After the 26th of September the north-west day-breeze came every morning with the same strength, beginning at ten or eleven o'clock, and ending suddenly at seven or eight in the evening. The moon was in her third quarter, and we had many successive days and nights of clear, cloudless sky. I believe this wind to be closely connected with the easterly trade-wind of the main Amazons; indeed, to be the same, reflected from the west after the land-surface in that quarter has been cooled by it to a much lower point than the sun-heated surface of the stagnant Tapajos. The wind always arose in the morning after the air in the direction of the north-west had been further cooled by radiation of heat during the night; and it ceased in the evening, when the equilibrium of temperature between the Tapajos and the Amazons had become restored. The light land breeze from the east which always began to blow soon after the strong north-wester ceased, is attributable in like manner to the wooded surface of the land being then cooler than the air on the river. The terral lasted generally from 7 until 11 p.m., but after midnight it usually veered gradually to the north-east, and blew rather freshly from that quarter towards sunrise.

Point Jaguararí forms at this season of the year a high sandbank, which is prolonged as a narrow spit, stretching about three miles towards the middle of the river. We rounded this with great difficulty in the night of the 29th; reaching before daylight a good shelter behind a similar sandbank at Point Acará-tingarí, a headland situated not more than five miles in a straight line from our last anchoring place. We remained here all day; the men beating *timbó* in a quiet pool between the sandbank and the mainland, and obtaining a great quantity of fish, from which I selected six species new to my collection. We made rather better progress the two following nights, but the terral now always blew strongly from the north-north-east after midnight, and thus limited the hours during which we could navigate, forcing us to seek the nearest shelter to avoid being driven back faster than we came.

On the 2nd of October we reached Point Cajetúba and had a pleasant day ashore. The river scenery in this neighbourhood is of the greatest beauty. A few houses of settlers are seen at the bottom of the broad bay of Aramána-í at the foot of a range of richly-timbered hills, the high beach of snow-white sand stretching in a bold curve from point to point. The opposite shores of the river are ten or eleven miles distant, but towards the north is a clear horizon of water and sky. The country near Point Cajetúba is similar to the neighbourhood of Santarem: namely, campos with scattered trees. We gathered a large quantity of wild fruit: Cajú, Umirí, and Aápiránga. The Umirí berry (Humirium floribundum) is a black drupe similar in

appearance to the damascene plum, and not greatly unlike it in taste. The Aápiránga is a bright vermilion-coloured berry, with a hard skin and a sweet viscid pulp enclosing the seeds. Between the point and Altar do Chaõ was a long stretch of sandy beach with moderately deep water; our men, therefore, took a rope ashore and towed the cuberta at merry speed until we reached the village. A long, deeply-laden canoe with miners from the interior provinces here passed us. It was manned by ten Indians, who propelled the boat by poles; the men, five on each side, trotting one after the other along a plank arranged for the purpose from stem to stern.

It took us two nights to double Point Cururú, where, as already mentioned, the river bends from its northerly course beyond Altar do Chaõ. A confused pile of rocks, on which many a vessel heavily laden with farinha has been wrecked, extends at the season of low water from the foot of a high bluff far into the stream. We were driven back on the first night (October 3rd) by a squall. The light terral was carrying us pleasantly round the spit, when a small black cloud which lay near the rising moon suddenly spread over the sky to the northward; the land-breeze then ceased, and furious blasts began to blow across the river. We regained, with great difficulty, the shelter of the point. It blew almost a hurricane for two hours, during the whole of which time the sky over our heads was beautifully clear and starlit. Our shelter at first was not very secure, for the wind blew away the lashings of our sails, and caused our anchor to drag. Angelo Custodio, however, seized a rope which

was attached to the foremast and leapt ashore; had he not done so, we should probably have been driven many miles backwards up the storm-tossed river. After the cloud had passed, the regular east wind began to blow, and our further progress was effectually stopped for the night. The next day we all went ashore, after securing well the canoe, and slept from eleven o'clock till five under the shade of trees.

The distance between Point Cururú and Santarem was accomplished in three days, against the same difficulties of contrary and furious winds, shoaly water, and rocky coasts. I was thankful at length to be safely housed, with the whole of my collections, made under so many privations and perils, landed without the loss or damage of a specimen. The men, after unloading the canoe and delivering it to its owner, came to receive their payment. They took part in goods and part in money, and after a good supper, on the night of the 7th October, shouldered their bundles and set off to walk by land some eighty miles to their homes. I was rather surprised at the good feeling exhibited by these poor Indians at parting. Angelo Custodio said that whenever I should wish to make another voyage up the Tapajos, he would be always ready to serve me as pilot. Alberto was undemonstrative as usual; but Ricardo, with whom I had had many sharp quarrels, actually shed tears when he shook hands and bid me the final "adeos."

## CHAPTER III.

### THE UPPER AMAZONS—VOYAGE TO EGA.

Departure from Barra—First day and night on the Upper Amazons—Desolate appearance of river in the flood season—Cucáma Indians—Mental condition of Indians—Squalls—Manatee—Forest—Floating pumice-stones from the Andes—Falling banks—Ega and its inhabitants—Daily life of a Naturalist at Ega—Customs, trade, &c.—The four seasons of the Upper Amazons.

I MUST now take the reader from the picturesque, hilly country of the Tapajos, and its dark, streamless waters, to the boundless, wooded plains and yellow, turbid current of the Upper Amazons or Solimoens. I will resume the narrative of my first voyage up the river, which was interrupted at the Barra of the Rio Negro in the seventh chapter to make way for the description of Santarem and its neighbourhood.

I embarked at Barra on the 26th of March, 1850, three years before steamers were introduced on the upper river, in a cuberta which was returning to Ega, the first and only town of any importance in the vast solitudes of the Solimoens, from Santarem, whither it had been sent with a cargo of turtle oil in earthenware jars. The owner, an old white-haired Portuguese trader of Ega named Daniel Cardozo, was then at Barra, attending

the assizes as juryman, a public duty performed without remuneration, which took him six weeks away from his business. He was about to leave Barra himself, in a small boat, and recommended me to send forward my heavy baggage in the cuberta and make the journey with him. He would reach Ega, 370 miles distant from Barra, in twelve or fourteen days; whilst the large vessel would be thirty or forty days on the road. I preferred, however, to go in company with my luggage, looking forward to the many opportunities I should have of landing and making collections on the banks of the river.

I shipped the collections made between Pará and the Rio Negro in a large cutter which was about descending to the capital, and after a heavy day's work got all my chests aboard the Ega canoe by eight o'clock at night. The Indians were then all embarked, one of them being brought dead drunk by his companions, and laid to sober himself all night on the wet boards of the tombadilha. The cabo, a spirited young white, named Estulano Alves Carneiro, who has since risen to be a distinguished citizen of the new province of the Upper Amazons, soon after gave orders to get up the anchor. The men took to the oars, and in a few hours we crossed the broad mouth of the Rio Negro; the night being clear, calm, and starlit, and the surface of the inky waters smooth as a lake.

When I awoke the next morning, we were progressing by espia along the left bank of the Solimoens. The rainy season had now set in over the region through which the great river flows; the sand-banks and all the

lower lands were already under water, and the tearing current, two or three miles in breadth, bore along a continuous line of uprooted trees and islets of floating plants. The prospect was most melancholy ; no sound was heard but the dull murmur of the waters ; the coast along which we travelled all day was encumbered every step of the way with fallen trees, some of which quivered in the currents which set around projecting points of land. Our old pest, the Motúca, began to torment us as soon as the sun gained power in the morning. White egrets were plentiful at the edge of the water, and humming-birds, in some places, were whirring about the flowers overhead. The desolate appearance of the landscape increased after sunset, when the moon rose in mist.

This upper river, the Alto-Amazonas or Solimoens, is always spoken of by the Brazilians as a distinct stream. This is partly owing, as before remarked, to the direction it seems to take at the fork of the Rio Negro ; the inhabitants of the country, from their partial knowledge, not being able to comprehend the whole river system in one view. It has, however, many peculiarities to distinguish it from the lower course of the river. The trade-wind or sea-breeze, which reaches, in the height of the dry season, as far as the mouth of the Rio Negro, 900 or 1000 miles from the Atlantic, never blows on the upper river. The atmosphere is therefore more stagnant and sultry, and the winds that do prevail are of irregular direction and short duration. A great part of the land on the borders of the Lower Amazons is hilly ; there are extensive campos or open plains, and

long stretches of sandy soil clothed with thinner forests. The climate, in consequence, is comparatively dry, many months in succession during the fine season passing without rain. All this is changed on the Solimoens. A fortnight of clear, sunny weather is a rarity: the whole region through which the river and its affluents flow, after leaving the easternmost ridges of the Andes, which Pöppig describes as rising like a wall from the level country 240 miles from the Pacific, is a vast plain, about 1000 miles in length, and 500 or 600 in breadth, covered with one uniform, lofty, impervious, and humid forest. The soil is nowhere sandy, but always either a stiff clay, alluvium, or vegetable mould, which latter, in many places, is seen in water-worn sections of the river banks to be twenty or thirty feet in depth. With such a soil and climate, the luxuriance of vegetation, and the abundance and beauty of animal forms which are already so great in the region nearer the Atlantic, increase on the upper river. The fruits, both wild and cultivated, common to the two sections of the country, reach a progressively larger size in advancing westward, and some trees which blossom only once a year at Pará and Santarem, yield flower and fruit all the year round at Ega. The climate is healthy, although one lives here as in a permanent vapour bath. I must not, however, give here a lengthy description of the region whilst we are yet on its threshold. I resided and travelled on the Solimoens altogether for four years and a half. The country on its borders is a magnificent wilderness where civilized man, as yet, has scarcely obtained a footing; the culti-

vated ground from the Rio Negro to the Andes amounting only to a few score acres. Man, indeed, in any condition, from his small numbers, makes but an insignificant figure in these vast solitudes. It may be mentioned that the Solimoens is 2130 miles in length, if we reckon from the source of what is usually considered the main stream (Lake Lauricocha, near Lima) ; but 2500 miles by the route of the Ucayali, the most considerable and practicable fork of the upper part of the river. It is navigable at all seasons by large steamers for upwards of 1400 miles from the mouth of the Rio Negro.

On the 28th we passed the mouth of Ariauü, a narrow inlet which communicates with the Rio Negro, emerging in front of Barra. Our vessel was nearly drawn into this by the violent current which set from the Solimoens. The towing-cable was lashed to a strong tree about thirty yards ahead, and it took the whole strength of crew and passengers to pull across. We passed the Guariba, a second channel connecting the two rivers, on the 30th, and on the 31st sailed past a straggling settlement called Manacápurú, situated on a high, rocky bank. Many citizens of Barra have *sitios*, or country-houses, in this place, although it is eighty miles distant from the town by the nearest road. They come here for a few weeks in the fine season to economise, and pass the time in planting on a small scale, fishing, and trading. The custom of having two places of residence is very general throughout the country, and exists amongst the aborigines, at least the more advanced tribes. Some of the

establishments at Manacápurú are large and of old date, shown by the number and size of the mangos and other introduced fruit-trees. The houses, though spacious, were now in a neglected and ruinous condition. Estulano and I landed at one of them, and dined off roasted wild hog with the owner, an uncommonly lively little old man, named Feyres. The place looked dirty and desolate; the stucco and whitewash had peeled off in great pieces from the walls; the doors and window-shutters were broken and off their hinges; the dingy mud-floors were covered with litter, and the cultivated grounds around the house choked with weeds. The high bank, and with it the settlement, terminates at the mouth of a narrow channel which leads to a large interior lake abounding in fish, manatee, and turtle.

Beyond Manacápurú all traces of high land cease; both shores of the river, henceforward for many hundred miles, are flat, except in places where the Tabatinga formation appears in clayey elevations of from twenty to forty feet above the line of highest water. The country is so completely destitute of rocky or gravelly beds that not a pebble is seen during many weeks' journey. Our voyage was now very monotonous. After leaving the last house at Manacápurú we travelled nineteen days without seeing a human habitation, the few settlers being located on the banks of inlets or lakes some distance from the shores of the main river. We met only one vessel during the whole of the time, and this did not come within hail, as it was drifting down in the middle of the current in a broad part of the river two

miles from the bank along which we were laboriously warping our course upwards.

After the first two or three days we fell into a regular way of life aboard. Our crew was composed of ten Indians of the Cucáma nation, whose native country is a portion of the borders of the upper river in the neighbourhood of Nauta, in Peru. The Cucámas speak the Tupí language, using, however, a harsher accent than is common amongst the semi-civilized Indians from Ega downwards. They are a shrewd, hard-working people, and are the only Indians who willingly and in a body engage themselves to navigate the canoes of traders. The pilot, a steady and faithful fellow named Vicente, told me that he and his companions had now been fifteen months absent from their wives and families, and that on arriving at Ega they intended to take the first chance of a passage to Nauta. There was nothing in the appearance of these men to distinguish them from canoemen in general. Some were tall and well built, others had squat figures with broad shoulders and excessively thick arms and legs. No two of them were at all similar in the shape of the head: Vicente had an oval visage with fine regular features, whilst a little dumpy fellow, the wag of the party, was quite a Mongolian in breadth and prominence of cheek, spread of nostrils, and obliquity of eyes; these two formed the extremes as to face and figure. None of them were tattooed or disfigured in any way; they were all quite destitute of beard. The Cucámas are notorious on the river for their provident habits. The desire of acquiring property is so rare a

trait in Indians that the habits of these people are remarked on with surprise by the Brazilians. The first possession which they strive to acquire on descending the river into Brazil, which all the Peruvian Indians look upon as a richer country than their own, is a wooden trunk with lock and key ; in this they stow away carefully all their earnings converted into clothing, hatchets, knives, harpoon heads, needles and thread, and so forth. Their wages are only fourpence or sixpence a day, which are often paid in goods charged a hundred per cent. above Pará prices, so that it takes them a long time to fill their chest.

It would be difficult to find a better-behaved set of men in a voyage than these poor Indians. During our thirty-five days' journey they lived and worked together in the most perfect good fellowship. I never heard an angry word pass amongst them. Senhor Estulano let them navigate the vessel in their own way, exerting his authority only now and then when they were inclined to be lazy. Vicente regulated the working hours. These depended on the darkness of the nights. In the first and second quarters of the moon they kept it up with *espia,* or oars, until towards midnight; in the third and fourth quarters they were allowed to go to sleep soon after sunset, and aroused at three or four o'clock in the morning to resume their work. On cool, rainy days we all bore a hand at the *espia,* trotting with bare feet on the sloppy deck in Indian file to the tune of some wild boatman's chorus. We had a favourable wind for two days only out of the thirty-five, by which we made about forty miles ; the rest of our long journey

was accomplished literally by pulling our way from tree to tree. When we encountered a *remanso* near the shore we got along very pleasantly for a few miles by rowing; but this was a rare occurrence. During leisure hours the Indians employed themselves in sewing. Vicente was a good hand at cutting out shirts and trousers, and acted as master tailor to the whole party. Each had a thick steel thimble and a stock of needles and thread of his own. Vicente made for me a set of blue-check cotton shirts during the passage.

The goodness of these Indians, like that of most others amongst whom I lived, consisted perhaps more in the absence of active bad qualities, than in the possession of good ones; in other words, it was negative rather than positive. Their phlegmatic, apathetic temperament; coldness of desire and deadness of feeling; want of curiosity and slowness of intellect, make the Amazonian Indians very uninteresting companions anywhere. Their imagination is of a dull, gloomy quality, and they seem never to be stirred by the emotions:—love, pity, admiration, fear, wonder, joy, enthusiasm. These are characteristics of the whole race. The good fellowship of our Cucámas seemed to arise, not from warm sympathy, but simply from the absence of eager selfishness in small matters. On the morning when the favourable wind sprung up, one of the crew, a lad of about seventeen years of age, was absent ashore at the time of starting, having gone alone in one of the montarias to gather wild fruit. The sails were spread and we travelled for several

hours at great speed, leaving the poor fellow to paddle after us against the strong current. Vicente, who might have waited a few minutes at starting, and the others, only laughed when the hardship of their companion was alluded to. He overtook us at night, having worked his way with frightful labour the whole day without a morsel of food. He grinned when he came on board, and not a dozen words were said on either side.

Their want of curiosity is extreme. One day we had an unusually sharp thunder-shower. The crew were lying about the deck, and after each explosion all set up a loud laugh; the wag of the party exclaiming "There's my old uncle hunting again!" an expression showing the utter emptiness of mind of the spokesman. I asked Vicente what he thought was the cause of lightning and thunder? He said, "Timaá ichoquá,"—I don't know. He had never given the subject a moment's thought! It was the same with other things. I asked him who made the sun, the stars, the trees? He didn't know, and had never heard the subject mentioned amongst his tribe. The Tupí language, at least as taught by the old Jesuits, has a word—Tupána—signifying God. Vicente sometimes used this word, but he showed by his expressions that he did not attach the idea of a Creator to it. He seemed to think it meant some deity or visible image which the whites worshipped in the churches he had seen in the villages. None of the Indian tribes on the Upper Amazons have an idea of a Supreme Being, and consequently have no word to express it in their own languages. Vicente thought the river on which we

were travelling encircled the whole earth, and that the land was an island like those seen in the stream, but larger. Here a gleam of curiosity and imagination in the Indian mind is revealed: the necessity of a theory of the earth and water has been felt, and a theory has been suggested. In all other matters not concerning the common wants of life the mind of Vicente was a blank, and such I always found to be the case with the Indian in his natural state. Would a community of any race of men be otherwise, were they isolated for centuries in a wilderness like the Amazonian Indians, associated in small numbers wholly occupied in procuring a mere subsistence, and without a written language, or a leisured class to hand down acquired knowledge from generation to generation?

One day a smart squall gave us a good lift onward; it came with a cold, fine, driving rain, which enveloped the desolate landscape as with a mist: the forest swayed and roared with the force of the gale, and flocks of birds were driven about in alarm over the tree-tops. On another occasion a similar squall came from an unfavourable quarter: it fell upon us quite unawares when we had all our sails out to dry, and blew us broadside foremost on the shore. The vessel was fairly lifted on to the tall bushes which lined the banks, but we sustained no injury beyond the entanglement of our rigging in the branches. The days and nights usually passed in a dead calm, or with light intermittent winds from up river and consequently full against us. We landed twice a day to give ourselves and the Indians a little

rest and change, and to cook our two meals—breakfast and dinner. There was another passenger beside myself—a cautious, middle-aged Portuguese, who was going to settle at Ega, where he had a brother long since established. He was accommodated in the fore-cabin, or arched covering over the hold. I shared the cabin-proper with Senhores Estulano and Manoel, the latter a young half-caste, son-in-law to the owner of the vessel, under whose tuition I made good progress in learning the Tupí language during the voyage.

Our men took it in turns, two at a time, to go out fishing ; for which purpose we carried a spare montaria. The master had brought from Barra, as provisions, nothing but stale, salt pirarucú—half-rotten fish, in large, thin, rusty slabs—farinha, coffee, and treacle. In these voyages passengers are expected to provide for themselves, as no charge is made except for freight of the heavy luggage or cargo they take with them. The Portuguese and myself had brought a few luxuries, such as beans, sugar, biscuits, tea, and so forth ; but we found ourselves almost obliged to share them with our two companions and the pilot, so that before the voyage was one-third finished, the small stock of most of these articles was exhausted. In return, we shared in whatever the men brought. Sometimes they were quite unsuccessful, for fish is extremely difficult to procure in the season of high water, on account of the lower lands lying between the inlets and infinite chain of pools and lakes being flooded from the main river, thus increasing tenfold the area over which the finny population has

to range. On most days, however, they brought two or three fine fish, and once they harpooned a manatee, or Vacca marina. On this last-mentioned occasion we made quite a holiday ; the canoe was stopped for six or seven hours, and all turned out into the forest to help to skin and cook the animal. The meat was cut into cubical slabs, and each person skewered a dozen or so of these on a long stick. Fires were made, and the spits stuck in the ground and slanted over the flames to roast. A drizzling rain fell all the time, and the ground around the fires swarmed with stinging ants, attracted by the entrails and slime which were scattered about. The meat has somewhat the taste of very coarse pork ; but the fat, which lies in thick layers between the lean parts, is of a greenish colour, and of a disagreeable, fishy flavour. The animal was a large one, measuring nearly ten feet in length, and nine in girth at the broadest part. The manatee is one of the few objects which excite the dull wonder and curiosity of the Indians, notwithstanding its commonness. The fact of its suckling its young at the breast, although an aquatic animal resembling a fish, seems to strike them as something very strange. The animal, as it lay on its back, with its broad rounded head and muzzle, tapering body, and smooth, thick, lead-coloured skin, reminded me of those Egyptian tombs which are made of dark, smooth stone, and shaped to the human figure.

It rarely happened that we caught anything near the canoe ; but one day, as we were slowly progressing along a *remanso* past a thick bed of floating grasses, the men caught sight of a large Pirarucú : the fish

which, salted, forms the staple food of all classes in most parts of the Lower Amazons country. It darted past with great speed close to the surface of the water, exhibiting its ornamental coat of mail, the extremely large, broad scales being margined with bright red. One of the Indians seized a harpoon and, jumping into the montaria, was after it in a moment. He killed it at the distance of a few yards, as it was plunging amongst the entangled beds of grass. The fish was a nearly full-grown one, measuring eight feet in length and five in girth, and supplied us all with two plentiful meals. The best parts only were cooked, the rest being thrown most improvidently to the vultures. The Indian name Pirarucú, or Anatto fish (from Pira, fish ; and urucú, anatto or red), is in allusion to the red colour of the borders of its scales, and is a sample of the figurative style of nomenclature of the Tupí nation.

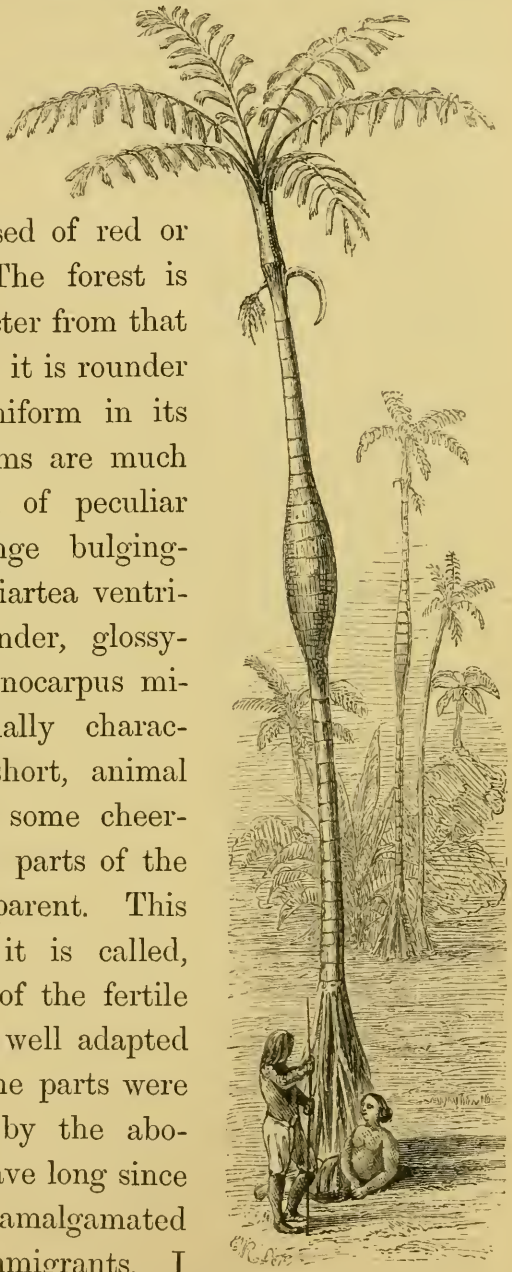
Notwithstanding the hard fare, the confinement of the canoe, the trying weather,—frequent and drenching rains with gleams of fiery sunshine,—and the woful desolation of the river scenery, I enjoyed the voyage on the whole. We were not much troubled by mosquitoes, and therefore passed the nights very pleasantly, sleeping on deck wrapped in blankets or old sails. When the rains drove us below we were less comfortable, as there was only just room in the small cabin for three of us to lie close together, and the confined air was stifling. I became inured to the Piums in the course of the first week ; all the exposed parts of my body, by that time, being so closely covered with black punctures that the

little bloodsuckers could not very easily find an unoccupied place to operate upon. Poor Miguel, the Portuguese, suffered horribly from these pests, his ancles and wrists being so much inflamed that he was confined to his hammock, slung in the hold, for weeks. At every landing-place I had a ramble in the forest whilst the red skins made the fire and cooked the meal. The result was a large daily addition to my collection of insects, reptiles, and shells. Sometimes the neighbourhood of our gipsy-like encampment was a tract of dry and spacious forest pleasant to ramble in; but more frequently it was a rank wilderness, into which it was impossible to penetrate many yards, on account of uprooted trees, entangled webs of monstrous woody climbers, thickets of spiny bamboos, swamps, or obstacles of one kind or other. The drier lands were sometimes beautified to the highest degree by groves of the Urucurí palm (Attalea excelsa), which grew by thousands under the crowns of the lofty, ordinary forest trees; their smooth columnar stems being all of nearly equal height (forty or fifty feet), and their broad, finely-pinnated leaves interlocking above to form arches and woven canopies of elegant and diversified shapes. The fruit of this palm ripens on the upper river in April, and during our voyage I saw immense quantities of it strewn about under the trees in places where we encamped. It is similar in size and shape to the date, and has a pleasantly-flavoured juicy pulp. The Indians would not eat it; I was surprised at this, as they greedily devoured many other kinds of palm fruit whose sour and fibrous pulp was much less palatable.

Vicente shook his head when he saw me one day eating a quantity of the Urucurí plums. I am not sure they were not the cause of a severe indigestion under which I suffered for many days afterwards.

In passing slowly along the interminable wooded banks week after week, I observed that there were three tolerably distinct kinds of coast and corresponding forest constantly recurring on this upper river. First, there were the low and most recent alluvial deposits,—a mixture of sand and mud, covered with tall, broad-leaved grasses, or with the arrow-grass before described, whose feathery-topped flower-stem rises to a height of fourteen or fifteen feet. The only large trees which grow in these places are the Cecropiæ. Many of the smaller and newer islands were of this description. Secondly, there were the moderately high banks, which are only partially overflowed when the flood season is at its height; these are wooded with a magnificent, varied forest, in which a great variety of palms and broad-leaved Marantaceæ form a very large proportion of the vegetation. The general foliage is of a vivid light-green hue; the water frontage is sometimes covered with a diversified mass of greenery; but where the current sets strongly against the friable, earthy banks, which at low water are twenty-five to thirty feet high, these are cut away, and expose a section of forest where the trunks of trees loaded with epiphytes appear in massy colonnades. One might safely say that three-fourths of the land bordering the Upper Amazons, for a thousand miles, belong to this second class. The third description of coast is the higher, undulating, clayey

land, which appears only at long intervals, but extends sometimes for many miles along the borders of the river. The coast at these places is sloping, and composed of red or variegated clay. The forest is of a different character from that of the lower tracts: it is rounder in outline, more uniform in its general aspect; palms are much less numerous and of peculiar species — the strange bulging-stemmed species, Iriartea ventricosa, and the slender, glossy-leaved Bacába-í (Œnocarpus minor), being especially characteristic; and, in short, animal life, which imparts some cheerfulness to the other parts of the river, is seldom apparent. This "terra firme," as it is called, and a large portion of the fertile lower land, seemed well adapted for settlement; some parts were originally peopled by the aborigines, but these have long since become extinct or amalgamated with the white immigrants. I



Bulging-stemmed Palm: Pashiúba barrigudo (Iriartea ventricosa).

afterwards learnt that there were not more than eighteen or twenty families settled throughout the whole country from Manacapurú to Quarý, a distance of 240 miles; and these, as before observed, do not live on the banks of the main stream, but on the shores of inlets and lakes.

The fishermen twice brought me small rounded pieces of very porous pumice-stone, which they had picked up floating on the surface of the main current of the river. They were to me objects of great curiosity as being messengers from the distant volcanoes of the Andes: Cotopaxi, Llanganete, or Sangay, which rear their peaks amongst the rivulets that feed some of the early tributaries of the Amazons, such as the Macas, the Pastaza, and the Napo. The stones must have already travelled a distance of 1200 miles. I afterwards found them rather common: the Brazilians use them for cleaning rust from their guns, and firmly believe them to be solidified river foam. A friend once brought me, when I lived at Santarem, a large piece which had been found in the middle of the stream below Monte Alegre, about 900 miles further down the river: having reached this distance, pumice-stones would be pretty sure of being carried out to sea, and floated thence with the north-westerly Atlantic current to shores many thousand miles distant from the volcanoes which ejected them. They are sometimes found stranded on the banks in different parts of the river. Reflecting on this circumstance since I arrived in England, the probability of these porous fragments serving as vehicles for the transportation of seeds of plants, eggs of insects, spawn of fresh-water

fish, and so forth, has suggested itself to me. Their rounded, water-worn appearance showed that they must have been rolled about for a long time in the shallow streams near the sources of the rivers at the feet of the volcanoes, before they leapt the waterfalls and embarked on the currents which lead direct for the Amazons. They may have been originally cast on the land and afterwards carried to the rivers by freshets ; in which case the eggs and seeds of land insects and plants might be accidentally introduced and safely enclosed with particles of earth in their cavities. As the speed of the current in the rainy season has been observed to be from three to five miles an hour, they might travel an immense distance before the eggs or seeds were destroyed. I am ashamed to say that I neglected the opportunity, whilst on the spot, of ascertaining whether this was actually the case. The attention of Naturalists has only lately been turned to the important subject of occasional means of wide dissemination of species of animals and plants. Unless such be shown to exist, it is impossible to solve some of the most difficult problems connected with the distribution of plants and animals. Some species, with most limited powers of locomotion, are found in opposite parts of the earth, without existing in the intermediate regions ; unless it can be shown that these may have migrated or been accidentally transported from one point to the other, we shall have to come to the strange conclusion that the same species had been created in two separate districts.

Canoemen on the Upper Amazons live in constant

dread of the "terras cahidas," or landslips, which occasionally take place along the steep, earthy banks; especially when the waters are rising. Large vessels are sometimes overwhelmed by these avalanches of earth and trees. I should have thought the accounts of them exaggerated if I had not had an opportunity during this voyage of seeing one on a large scale. One morning I was awoke before sunrise by an unusual sound resembling the roar of artillery. I was lying alone on the top of the cabin; it was very dark, and all my companions were asleep, so I lay listening. The sounds came from a considerable distance, and the crash which had aroused me was succeeded by others much less formidable. The first explanation which occurred to me was that it was an earthquake; for, although the night was breathlessly calm, the broad river was much agitated and the vessel rolled heavily. Soon after, another loud explosion took place, apparently much nearer than the former one; then followed others. The thundering peal rolled backwards and forwards, now seeming close at hand, now far off; the sudden crashes being often succeeded by a pause or a long-continued dull rumbling. At the second explosion, Vicente, who lay snoring by the helm, awoke and told me it was a "terra cahida;" but I could scarcely believe him. The day dawned after the uproar had lasted about an hour, and we then saw the work of destruction going forward on the other side of the river, about three miles off. Large masses of forest, including trees of colossal size, probably 200 feet in height, were rocking to and fro, and falling headlong one after the other into the water. After each avalanche the wave

which it caused returned on the crumbly bank with tremendous force, and caused the fall of other masses by undermining them. The line of coast over which the landslip extended was a mile or two in length; the end of it, however, was hid from our view by an intervening island. It was a grand sight: each downfall created a cloud of spray; the concussion in one place causing other masses to give way a long distance from it, and thus the crashes continued, swaying to and fro, with little prospect of a termination. When we glided out of sight, two hours after sunrise, the destruction was still going on.

On the 9th of April we passed the mouth of a narrow channel which leads to an extensive lake called Anurí; it lies at the bottom of a long *enseada* or bay, on the north or left side of the river, around which sets the whole force of the current. The steamboat company have since established a station near this for supplying their vessels with firewood. A few miles beyond, on the opposite side, we saw the principal mouth of the Purús, a very large stream, whose sources are still unknown. Salsaparilla and Copaüba collectors, the only travellers on its waters, have ascended it in small boats a distance of two months' journey without meeting with any obstruction to navigation. This shows that its course lies to a very great extent within the level plain of the Upper Amazons. The mouth is not more than a quarter of a mile broad, and the water is of an olive-green colour.

We passed Cudajá on the 12th. This is a channel

which communicates with an extensive system of back-waters and lakes, lying between this part of the river and the Japurá, 250 miles further west. The inhabitants of the Solimoens give the name of Cupiyó to this little-known interior water-system. A Portuguese, whom I knew very well, once navigated it throughout its whole length. He described the country in glowing terms. The waters are clear ; some of the lakes are of vast extent, and the land everywhere is level and luxuriantly wooded. It is a more complete solitude than the banks of the main river, for the whole region is peopled only by a few families of Múra savages. The inhabitants of Ega, who are employed in the summer season in salting pirarucú, sometimes make their fishing stations on the sandy shores of one or other of these lakes. The largest of them, whose opposite or northern shore is said to be scarcely visible from the south side, is called Lake Múra, and is very seldom visited.

A number of long, straggling islands occur in mid-river beyond Cudajá. We passed the mouth of the Mamiyá, a black-water stream, on the 18th, and on the 19th arrived at the entrance to Lake Quarý. This is not, strictly speaking, a lake, but the expansion of the united beds of several affluents of the Solimoens, caused by the slowly-moving waters of the tributaries originally spreading out over the flat alluvial valley, into which they descend from the higher country of the early part of their course, instead of flowing directly into the full and swift current of the main river. Henceforward most of the branch rivers exhibit these lake-like expansions of their beds. The same phenomenon takes a

great variety of forms, and is shown, as already observed in the Tapajos and other tributaries of the Lower Amazons. The mouth of the Quarý, or the channel which connects the lake with the Solimoens, is only 200 or 300 yards broad, and has but a very feeble current. It is about half a mile long, and opens on a broad sheet of water which is not of imposing magnitude, as it is only a small portion of the lake, this having a rather sharp bend in its lower part, so that the whole extent is not visible at one view. There is a small village on the shores of the inner water, distant twelve hours' journey by boat from the entrance. We anchored within the mouth, and visited in the montaria two or three settlers, whose houses are built in picturesque situations on the banks of the lower lake not far inwards. Several small but navigable streams or inlets here fall into the Quarý ; the land appeared to be of the highest fertility ; we crossed a neck of land on foot, from one inlet to another, passing through extensive groves of coffee, planted in a loose manner amongst the forest trees. One of the settlers was a Gibraltar Jew, established here many years, and thoroughly reconciled to the ways of life of the semi-civilised inhabitants. We found him barefoot, with trousers turned up to the knee, busily employed with a number of Indians—men, women, and children—shelling and drying cacao, which grows wild in immense profusion in the neighbourhood. He seemed a lively and sensible fellow ; was a great admirer of the country, the climate, and the people, and had no desire to return to Europe. This was the only Jew I met with on the

upper river; there are several settled at Santarem, Cametá, and Pará, where, on account of their dealings being fairer than those of Portuguese traders, they do a good trade, and live on friendly terms with the Brazilians.

Our object here was to purchase a supply of fresh farinha and anything else we could find in the way of provisions, as our farinha had become rotten and unfit to eat, and we had been on short rations for several days. We got all we wanted except sugar; not a pound of this article of luxury was to be had, and we were obliged henceforward to sweeten our coffee with treacle, as is the general custom in this part of Brazil.

We left Quarý before sunrise on the 20th. On the 22nd we threaded the Paraná-mirím of Arauána-í, one of the numerous narrow by-waters which lie conveniently for canoes away from the main river, and often save a considerable circuit round a promontory or island. We rowed for half a mile through a magnificent bed of Victoria water-lilies; the flower-buds of which were just beginning to expand. Beyond the mouth of the Catuá, a channel leading to another great lake which we passed on the 25th, the river appeared greatly increased in breadth. We travelled for three days along a broad reach which both up and down river presented a blank horizon of water and sky: this clear view was owing to the absence of islands, but it renewed one's impressions of the magnitude of the stream, which here, 1200 miles from its mouth, showed so little diminution of width. Further westward a series of large islands commences, which divides the river into two and sometimes three

channels, each about a mile in breadth. We kept to the southernmost of these, travelling all day on the 30th April along a high and rather sloping bank.

In the evening we arrived at a narrow opening, which would be taken by a stranger navigating the main channel for the outlet of some insignificant stream : it was the mouth of the Teffé, on whose banks Ega is situated, the termination of our voyage. After having struggled for thirty-five days with the muddy currents and insect pests of the Solimoens, it was unspeakably refreshing to find one's-self again in a dark-water river, smooth as a lake and free from Pium and Motúca. The rounded outline, small foliage, and sombre green of the woods, which seemed to rest on the glassy waters, made a pleasant contrast to the tumultuous piles of rank, glaring, light-green vegetation, and torn, timber-strewn banks to which we had been so long accustomed on the main river. The men rowed lazily until night-fall, when, having done a laborious day's work, they discontinued and went to sleep, intending to make for Ega in the morning. It was not thought worth while to secure the vessel to the trees or cast anchor, as there was no current. I sat up for two or three hours after my companions had gone to rest, enjoying the solemn calm of the night. Not a breath of air stirred; the sky was of a deep blue, and the stars seemed to stand forth in sharp relief; there was no sound of life in the woods, except the occasional melancholy note of some nocturnal bird. I reflected on my own wandering life : I had now reached the end of the third stage of my journey,

and was now more than half way across the continent. It was necessary for me, on many accounts, to find a rich locality for Natural History explorations, and settle myself in it for some months or years. Would the neighbourhood of Ega turn out to be suitable, and should I, a solitary stranger on a strange errand, find a welcome amongst its people?

Our Indians resumed their oars at sunrise the next morning (May 1st), and after an hour's rowing along the narrow channel, which varies in breadth from 100 to 500 yards, we doubled a low wooded point, and emerged suddenly on the so-called Lake of Ega; a magnificent sheet of water, five miles broad—the expanded portion of the Teffé. It is quite clear of islands, and curves away to the west and south, so that its full extent is not visible from this side. To the left, on a gentle grassy slope at the point of junction of a broad tributary with the Teffé, lay the little settlement: a cluster of a hundred or so of palm-thatched cottages and whitewashed red-tiled houses, each with its neatly-enclosed orchard of orange, lemon, banana, and guava trees. Groups of palms, with their tall slender shafts and feathery crowns, overtopped the buildings and lower trees. A broad grass-carpeted street led from the narrow strip of white sandy beach to the rudely-built barn-like church with its wooden crucifix on the green before it, in the centre of the town. Cattle were grazing before the houses, and a number of dark-skinned natives were taking their morning bath amongst the canoes of various sizes which were anchored or moored to stakes in the port. We let off rockets and fired

salutes, according to custom, in token of our safe arrival, and shortly afterwards went ashore.

A few days' experience of the people and the forests of the vicinity showed me that I might lay myself out for a long, pleasant, and busy residence at this place. An idea of the kind of people I had fallen amongst may be conveyed by an account of my earliest acquaintances in the place. On landing, the owner of the canoe killed an ox in honour of our arrival, and the next day took me round the town to introduce me to the principal residents. We first went to the Delegado of police, Senhor Antonio Cardozo, of whom I shall have to make frequent mention by-and-by. He was a stout, broad-featured man, ranking as a white, but having a tinge of negro blood; his complexion, however, was ruddy, and scarcely betrayed the mixture. He received us in a very cordial, winning manner: I had afterwards occasion to be astonished at the boundless good nature of this excellent fellow, whose greatest pleasure seemed to be to make sacrifices for his friends. He was a Paraense, and came to Ega orignally as a trader; but not succeeding in this, he turned planter on a small scale, and collector of the natural commodities of the country, employing half-a-dozen Indians in the business. We then visited the military commandant, an officer in the Brazilian army, named Praia. He was breakfasting with the vicar, and we found the two in dishabille (morning-gown loose round the neck, and slippers), seated at a rude wooden table in an open mud-floored verandah, at the back of the house. Commander Praia was a little curly-headed

man (also somewhat of a mulatto), always merry and fond of practical jokes. His wife, Donna Anna, a dressy dame from Santarem, was the leader of fashion in the settlement. The vicar, Father Luiz Gonsalvo Gomez, was a nearly pure-blood Indian, a native of one of the neighbouring villages, but educated in Maranham, a city on the Atlantic seaboard. I afterwards saw a good deal of him, as he was an agreeable, sociable fellow, fond of reading and hearing about foreign countries, and quite free from the prejudices which might be expected in a man of his profession. I found him, moreover, a thoroughly upright, sincere, and virtuous man. He supported his aged mother and unmarried sisters in a very creditable way out of his small salary and emoluments. It is a pleasure to be able to speak in these terms of a Brazilian priest, for the opportunity occurs rarely enough.

Leaving these agreeable new acquaintances to finish their breakfast, we next called on the Director of the Indians of the Japurá, Senhor José Chrysostomo Monteiro, a thin wiry Mameluco, the most enterprising person in the settlement. Each of the neighbouring rivers with its numerous wild tribes is under the control of a Director, who is nominated by the Imperial Government. There are now no missions in the region of the Upper Amazons: the "gentios" (heathens, or unbaptized Indians) being considered under the management and protection of these despots, who, like the captains of Trabalhadores, before mentioned, use the natives for their own private ends; Senhor Chrysostomo had, at this time, 200 of the Japúra Indians in his employ. He

was half Indian himself, but was a far worse master to the red-skins than the whites usually are. We finished our rounds by paying our respects to a venerable native merchant, Senor Romaõ de Oliveira, a tall, corpulent, fine-looking old man, who received us with a naïve courtesy quite original in its way. He had been an industrious, enterprising man in his younger days, and had built a substantial range of houses and warehouses. The shrewd and able old gentleman knew nothing of the world beyond the wilderness of the Solimoens and its few thousands of isolated inhabitants; yet he could converse well and sensibly, making observations on men and things as sagaciously as though he had drawn them from long experience of life in a European capital. The semi-civilised Indians respected old Romaõ, and he had, consequently, a great number in his employ in different parts of the river: his vessels were always filled quicker with produce than those of his neighbours. On our leaving, he placed his house and store at my disposal. This was not a piece of empty politeness, for some time afterwards, when I wished to settle for the goods I had had of him, he refused to take any payment.

I made Ega my head-quarters during the whole of the time I remained on the Upper Amazons (four years and a half). My excursions into the neighbouring region extended sometimes as far as 300 and 400 miles from the place. An account of these excursions will be given in subsequent chapters; in the intervals between them I led a quiet, uneventful life in the settlement;

following my pursuit in the same peaceful, regular way as a Naturalist might do in a European village. For many weeks in succession my journal records little more than the notes made on my daily captures. I had a dry and spacious cottage, the principal room of which was made a workshop and study; here a large table was placed, and my little library of reference arranged on shelves in rough wooden boxes. Cages for drying specimens were suspended from the rafters by cords well anointed, to prevent ants from descending, with a bitter vegetable oil: rats and mice were kept from them by inverted *cuyas*, placed half-way down the cords. I always kept on hand a large portion of my private collection, which contained a pair of each species and variety, for the sake of comparing the old with the new acquisitions. My cottage was whitewashed inside and out about once a year by the proprietor, a native trader; the floor was of earth; the ventilation was perfect, for the outside air, and sometimes the rain as well, entered freely through gaps at the top of the walls under the eaves and through wide crevices in the doorways. Rude as the dwelling was, I look back with pleasure on the many happy months I spent in it. I rose generally with the sun, when the grassy streets were wet with dew, and walked down to the river to bathe: five or six hours of every morning were spent in collecting in the forest, whose borders lay only five minutes' walk from my house: the hot hours of the afternoon, between three and six o'clock, and the rainy days, were occupied in preparing and ticketing the specimens, making notes, dissecting, and drawing. I frequently had short rambles

by water in a small montaria, with an Indian lad to paddle. The neighbourhood yielded me, up to the last day of my residence, an uninterrupted succession of new and curious forms in the different classes of the animal kingdom, but especially insects.

I lived, as may already have been seen, on the best of terms with the inhabitants of Ega. Refined society, of course, there was none; but the score or so of decent, quiet families which constituted the upper class of the place were very sociable; their manners offered a curious mixture of naïve rusticity and formal politeness; the great desire to be thought civilised leads the most ignorant of these people (and they are all very ignorant, although of quick intelligence) to be civil and kind to strangers from Europe. I was never troubled with that impertinent curiosity on the part of the people in these interior places which some travellers complain of in other countries. The Indians and lower half-castes—at least such of them who gave any thought to the subject—seemed to think it natural that strangers should collect and send abroad the beautiful birds and insects of their country. The butterflies they universally concluded to be wanted as patterns for bright-coloured calico-prints. As to the better sort of people, I had no difficulty in making them understand that each European capital had a public museum, in which were sought to be stored specimens of all natural productions in the mineral, animal, and vegetable kingdoms. They could not comprehend how a man could study science for its own sake; but I told them I was collecting for the "Museo de Londres," and was paid for it; *that* was

very intelligible. One day, soon after my arrival, when I was explaining these things to a listening circle seated on benches in the grassy street, one of the audience, a considerable tradesman, a Mameluco native of Ega, got suddenly quite enthusiastic, and exclaimed "How rich are these great nations of Europe! We half-civilised creatures know nothing. Let us treat this stranger well, that he may stay amongst us and teach our children." We very frequently had social parties, with dancing and so forth; of these relaxations I shall have more to say presently. The manners of the Indian population also gave me some amusement for a long time. During the latter part of my residence, three wandering Frenchmen, and two Italians, some of them men of good education, on their road one after the other from the Andes down the Amazons, became enamoured of this delightfully-situated and tranquil spot, and made up their minds to settle here for the remainder of their lives. Three of them ended by marrying native women. I found the society of these friends a very agreeable change.

There were, of course, many drawbacks to the amenities of the place as a residence for a European; but these were not of the nature that my readers would perhaps imagine. There was scarcely any danger from wild animals: it seems almost ridiculous to refute the idea of danger from the natives in a country where even incivility to an unoffending stranger is a rarity. A Jaguar, however, paid us a visit one night. It was considered an extraordinary event, and so much uproar was made by the men who turned out with guns and

bows and arrows that the animal scampered off and was heard of no more. Alligators were rather troublesome in the dry season. During these months there was almost always one or two lying in wait near the bathing-place for anything that might turn up at the edge of the water; dog, sheep, pig, child, or drunken Indian. When this visitor was about, every one took extra care whilst bathing. I used to imitate the natives in not advancing far from the bank and in keeping my eye fixed on that of the monster, which stares with a disgusting leer along the surface of the water; the body being submerged to the level of the eyes, and the top of the head, with part of the dorsal crest, the only portions visible. When a little motion was perceived in the water behind the reptile's tail, bathers were obliged to beat a quick retreat. I was never threatened myself, but I often saw the crowds of women and children scared whilst bathing by the beast making a movement towards them; a general scamper to the shore and peals of laughter were always the result in these cases. The men can always destroy these alligators when they like to take the trouble to set out with montarias and harpoons for the purpose, but they never do it unless one of the monsters, bolder than usual, puts some one's life in danger. This arouses them, and they then track the enemy with the greatest pertinacity; when half killed they drag it ashore and despatch it amid loud execrations. Another, however, is sure to appear some days or weeks afterwards, and take the vacant place on the station. Besides alligators, the only animals to be feared are the poisonous serpents. These are certainly

common enough in the forest, but no accident happened during the whole time of my residence.

I suffered most inconvenience from the difficulty of getting news from the civilised world down river, from the irregularity of receipt of letters, parcels of books and periodicals, and towards the latter part of my residence from ill health arising from bad and insufficient food. The want of intellectual society, and of the varied excitement of European life, was also felt most acutely, and this, instead of becoming deadened by time, increased until it became almost insupportable. I was obliged, at last, to come to the conclusion that the contemplation of Nature alone is not sufficient to fill the human heart and mind. I got on pretty well when I received a parcel from England by the steamer once in two or four months. I used to be very economical with my stock of reading lest it should be finished before the next arrival and leave me utterly destitute. I went over the periodicals, the "Athenæum," for instance, with great deliberation, going through every number three times; the first time devouring the more interesting articles, the second, the whole of the remainder; and the third, reading all the advertisements from beginning to end. If four months (two steamers) passed without a fresh parcel, I felt discouraged in the extreme. I was worst off in the first year, 1850, when twelve months elapsed without letters or remittances. Towards the end of this time my clothes had worn to rags; I was barefoot, a great inconvenience in tropical forests, notwithstanding statements to the contrary that have been published by

travellers; my servant ran away, and I was robbed of nearly all my copper money. I was obliged then to descend to Pará, but returned, after finishing the examination of the middle part of the Lower Amazons and the Tapajos, in 1855, with my Santarem assistant and better provided for making collections on the upper river. This second visit was in pursuit of the plan before mentioned, of exploring in detail the whole valley of the Amazons, which I formed in Pará in the year 1851.

During so long a residence I witnessed, of course, many changes in the place. Some of the good friends who made me welcome on my first arrival, died, and I followed their remains to their last resting-place in the little rustic cemetery on the borders of the surrounding forest. I lived there long enough, from first to last, to see the young people grow up, attended their weddings and the christenings of their children, and, before I left, saw them old married folks with numerous families. In 1850 Ega was only a village, dependent on Pará 1400 miles distant, as the capital of the then undivided province. In 1852, with the creation of the new province of the Amazons, it became a city; returned its members to the provincial parliament at Barra; had its assizes, its resident judges, and rose to be the chief town of a *comarca* or county. A year after this, namely, in 1853, steamers were introduced on the Solimoens, and from 1855, one ran regularly every two months between the Rio Negro and Nauta in Peru, touching at all the villages, and accomplishing the distance in ascending, about 1200 miles, in eighteen

days. The trade and population, however, did not increase with these changes. The people became more "civilised," that is, they began to dress according to the latest Parisian fashions, instead of going about in stockingless feet, wooden clogs and shirt sleeves; acquired a taste for money getting and office holding; became divided into parties, and lost part of their former simplicity of manners. But the place remained, when I left it in 1859, pretty nearly what it was when I first arrived in 1850—a semi-Indian village, with much in the ways and notions of its people, more like those of a small country town in Northern Europe than a South American settlement. The place is healthy, and almost free from insect pests; perpetual verdure surrounds it; the soil is of marvellous fertility, even for Brazil; the endless rivers and labyrinths of channels teem with fish and turtle; a fleet of steamers might anchor at any season of the year in the lake, which has uninterrupted water communication straight to the Atlantic. What a future is in store for the sleepy little tropical village!

After speaking of Ega as a city, it will have a ludicrous effect to mention that the total number of its inhabitants is only about 1200. It contains just 107 houses, about half of which are miserably built mud-walled cottages, thatched with palm-leaves. A fourth of the population are almost always absent, trading or collecting produce on the rivers. The neighbourhood within a radius of thirty miles, and including two other small villages, contains probably 2000 more people. The settlement is one of the oldest in the country,

having been founded in 1688 by Father Samuel Fritz, a Bohemian Jesuit, who induced several of the docile tribes of Indians, then scattered over the neighbouring region, to settle on the site. From 100 to 200 acres of sloping ground around the place, were afterwards cleared of timber; but such is the encroaching vigour of vegetation in this country, that the site would quickly relapse into jungle if the inhabitants neglected to pull up the young shoots as they arose. There is a stringent municipal law which compels each resident to weed a given space around his dwelling. Every month, whilst I resided here, an inspector came round with his wand of authority, and fined every one who had not complied with the regulation. The Indians of the surrounding country have never been hostile to the European settlers. The rebels of Pará and the Lower Amazons, in 1835-6, did not succeed in rousing the natives of the Solimoens against the whites. A party of forty of them ascended the river for that purpose, but on arriving at Ega, instead of meeting with sympathisers as in other places, they were surrounded by a small body of armed residents, and shot down without mercy. The military commandant at the time, who was the prime mover in this orderly resistance to anarchy, was a courageous and loyal negro, named José Patricio, an officer known throughout the Upper Amazons for his unflinching honesty and love of order, whose acquaintance I had the pleasure of making at St. Paulo in 1858. Ega was the head-quarters of the great scientific commission, which met in the years from 1781 to 1791, to settle the boundaries between the Spanish

and Portuguese territories in South America. The chief commissioner for Spain, Don Francisco Requena, lived some time in the village with his family. I found only one person at Ega, my old friend Romaõ de Oliveira, who recollected, or had any knowledge of this important time, when a numerous staff of astronomers, surveyors, and draughtsmen, explored much of the surrounding country, with large bodies of soldiers and natives.

More than half the inhabitants of Ega are mamelucos; there are not more than forty or fifty pure whites; the number of negroes and mulattos is probably a little less, and the rest of the population consists of pure blood Indians. Every householder, including Indians and free negroes, is entitled to a vote in the elections, municipal, provincial, and imperial, and is liable to be called on juries, and to serve in the national guard. These privileges and duties of citizenship do not seem at present to be appreciated by the more ignorant coloured people. There is, however, a gradual improvement taking place in this respect. Before I left there was a rather sharp contest for the Presidency of the Municipal Chamber, and most of the voters took a lively interest in it. There was also an election of members to represent the province in the Imperial Parliament at Rio Janeiro, in which each party strove hard to return its candidate. On this occasion, an unscrupulous lawyer was sent by the government party from the capital to overawe the opposition to its nominee; many of the half-castes, headed by my old friend John da Cunha, who was then settled at Ega,

fought hard, but with perfect legality and good humour, against this powerful interest. They did not succeed; and although the government agent committed many tyrannical and illegal acts, the losing party submitted quietly to their defeat. In a larger town, I believe, the government would not have dared to attempt thus to control the elections. I think I saw enough to warrant the conclusion that the machinery of constitutional government would, with a little longer trial, work well amongst the mixed Indian, white, and negro population, even of this remote part of the Brazilian empire. I attended, also, before I left, several assize meetings at Ega, and witnessed the novel sight of negro, white, half-caste, and Indian, sitting gravely side by side on the jury bench.

The way in which the coloured races act under the conditions of free citizenship, is a very interesting subject. Brazilian statesmen seem to have abandoned the idea, if they ever entertained it, of making this tropical empire a nation of whites, with a slave labouring class. The greatest difficulty on the Amazons is with the Indians. The general inflexibility of character of the race, and their abhorrence of the restraints of civilised life, make them very intractable subjects. Some of them, however, who have learned to read and write, and whose dislike to live in towns has been overcome by some cause acting early in life, make very good citizens. I have already mentioned the priest, who is a good example of what early training can do. There can be no doubt that if the docile Amazonian Indians were kindly treated by their white fellow-citizens, and educated, they would not be so

quick as they have hitherto shown themselves to be to leave the towns and return into their half wild condition on the advancing civilisation of the places. The inflexibility of character, although probably organic, is seen to be sometimes overcome. The principal blacksmith of Ega, Senhor Macedo, was also an Indian, and a very sensible fellow. He sometimes filled minor offices in the government of the place. He used to come very frequently to my house to chat, and was always striving to acquire solid information about things. When Donati's comet appeared, he took a great interest in it. We saw it at its best from the 3rd to the 10th of October (1858), between which dates it was visible near the western horizon, just after sunset ; the tail extending in a broad curve towards the north, and forming a sublime object. Macedo consulted all the old almanacs in the place to ascertain whether it was the same comet as that of 1811, which he said he well remembered. Before the Indians can be reclaimed in large numbers, it is most likely they will become extinct as a race. There is less difficulty with regard to the mamelucos, who, even when the proportion of white blood is small, sometimes become enterprising and versatile people. The Indian element in the blood and character seems to be quite lost, or dominated in the offspring of white and mameluco, that is in the fruits of the second cross. I saw a striking example of this in the family of a French blacksmith, who had lived for many years on the banks of the Solimoens, and had married a mameluco woman. His children might have all passed as natives of Northern Europe, a little

tanned by foreign travel. One of them, a charming young girl named Isabel, was quite a blonde, having gray eyes, light brown hair, and fair complexion ; yet her grandmother was a tattooed Indian of the Tucúna tribe.

Many of the Ega Indians, including all the domestic servants, are savages who have been brought from the neighbouring rivers ; the Japurá, the Issá, and the Solimoens. I saw here individuals of at least sixteen different tribes ; most of whom had been bought, when children, of the native chiefs. This species of slave dealing, although forbidden by the laws of Brazil, is winked at by the authorities, because, without it, there would be no means of obtaining servants. They all become their own masters when they grow up, and never show the slightest inclination to return to utter savage life. But the boys generally run away and embark on the canoes of traders ; and the girls are often badly treated by their mistresses, the jealous, passionate, and ill-educated Brazilian women. Nearly all the enmities which arise amongst residents at Ega and other places, are caused by disputes about Indian servants. No one who has lived only in old settled countries, where service can be readily bought, can imagine the difficulties and annoyances of a land where the servant class are ignorant of the value of money, and hands cannot be obtained except by coaxing them from the employ of other masters.

Great mortality takes place amongst the poor captive children on their arrival at Ega. It is a singular circumstance, that the Indians residing on the Japurá

and other tributaries always fall ill on descending to the Solimoens, whilst the reverse takes place with the inhabitants of the banks of the main river, who never fail of taking intermittent fever when they first ascend these branch rivers, and of getting well when they return. The finest tribes of savages who inhabit the country near Ega are the Jurís and Passés: these are now, however, nearly extinct, a few families only remaining on the banks of the retired creeks connected with the Teffé, and on other branch rivers between the Teffé and the Jutahí. They are a peaceable, gentle, and industrious people, devoted to agriculture and fishing, and have always been friendly to the whites. I shall have occasion to speak again of the Passés, who are a slenderly-built and superior race of Indians, distinguished by a large, square tattooed patch in the middle of their faces. The principal cause of their decay in numbers seems to be a disease which always appears amongst them when a village is visited by people from the civilised settlements—a slow fever, accompanied by the symptoms of a common cold, "defluxo," as the Brazilians term it, ending probably in consumption. The disorder has been known to break out when the visitors were entirely free from it; the simple contact of civilised men, in some mysterious way being sufficient to create it. It is generally fatal to the Jurís and Passés: the first question the poor, patient Indians now put to an advancing canoe is, "Do you bring defluxo?"

My assistant, José, in the last year of my residence at Ega, "resgatou" (ransomed, the euphemism in use for pur-

chased) two Indian children, a boy and a girl, through a Japurá trader. The boy was about twelve years of age, and of an unusually dark colour of skin : he had, in fact, the tint of a Cafuzo, the offspring of Indian and negro. It was thought he had belonged to some perfectly wild and houseless tribe, similar to the Parárauátes of the Tapajos, of which there are several in different parts of the interior of South America. His face was of regular, oval shape, but his glistening black eyes had a wary, distrustful expression, like that of a wild animal ; and his hands and feet were small and delicately formed. Soon after his arrival, finding that none of the Indian boys and girls in the houses of our neighbours understood his language, he became sulky and reserved ; not a word could be got from him until many weeks afterwards, when he suddenly broke out with complete phrases of Portuguese. He was ill of swollen liver and spleen, the result of intermittent fever, for a long time after coming into our hands. We found it difficult to cure him, owing to his almost invincible habit of eating earth, baked clay, pitch, wax, and other similar substances. Very many children on the upper parts of the Amazons have this strange habit ; not only Indians, but negroes and whites. It is not, therefore, peculiar to the famous Otomacs of the Orinoco, described by Humboldt, or to Indians at all, and seems to originate in a morbid craving, the result of a meagre diet of fish, wild-fruits, and mandioca-meal. We gave our little savage the name of Sebastian. The use of these Indian children is to fill water-jars from the river, gather fire-wood in the forest, cook, assist in paddling the montaria in excursions, and

so forth. Sebastian was often my companion in the woods, where he was very useful in finding the small birds I shot, which sometimes fell in the thickets amongst confused masses of fallen branches and dead leaves. He was wonderfully expert at catching lizards with his hands, and at climbing. The smoothest stems of palm-trees offered little difficulty to him: he would gather a few lengths of tough, flexible lianas; tie them in a short, endless band to support his feet with in embracing the slippery shaft, and then mount upwards by a succession of slight jerks. It was very amusing, during the first few weeks, to witness the glee and pride with which he would bring to me the bunches of fruit he had gathered from almost inaccessible trees. He avoided the company of boys of his own race, and was evidently proud of being the servant of a real white man. We brought him down with us to Pará: but he showed no emotion at any of the strange sights of the capital; the steam-vessels, large ships and houses, horses and carriages, the pomp of church ceremonies, and so forth. In this he exhibited the usual dulness of feeling and poverty of thought of the Indian; he had, nevertheless, very keen perceptions, and was quick at learning any mechanical art. José, who had resumed, some time before I left the country, his old trade of goldsmith, made him his apprentice, and he made very rapid progress; for after about three months' teaching he came to me one day with radiant countenance and showed me a gold ring of his own making.

The fate of the little girl, who came with a second batch of children all ill of intermittent fever, a month

or two after Sebastian, was very different. She was brought to our house, after landing, one night in the wet season, when the rain was pouring in torrents, thin and haggard, drenched with wet and shivering with ague. An old Indian who brought her to the door, said briefly, "ecui encommenda" (here's your little parcel or order), and went away. There was very little of the savage in her appearance, and she was of a much lighter colour than the boy. We found she was of the Miránha tribe, all of whom are distinguished by a slit, cut in the middle of each wing of the nose, in which they wear on their holiday occasions a large button made of pearly river-shell. We took the greatest care of our little patient; had the best nurses in the town, fomented her daily, gave her quinine and the most nourishing food; but it was all of no avail: she sank rapidly; her liver was enormously swollen and almost as hard to the touch as stone. There was something uncommonly pleasing in her ways, and quite unlike anything I had yet seen in Indians. Instead of being dull and taciturn, she was always smiling and full of talk. We had an old woman of the same tribe to attend her, who explained what she said to us. She often begged to be taken to the river to bathe; asked for fruit, or coveted articles she saw in the room for play-things. Her native name was Oria. The last week or two she could not rise from the bed we had made for her in a dry corner of the room: when she wanted lifting, which was very often, she would allow no one to help her but me, calling me by the name of "Caríwa" (white man), the only word of Tupí she seemed to

know. It was inexpressibly touching to hear her as she lay, repeating by the hour the verses which she had been taught to recite with her companions in her native village : a few sentences repeated over and over again with a rhythmic accent, and relating to objects and incidents connected with the wild life of her tribe. We had her baptized before she died, and when this latter event happened, in opposition to the wishes of the big people of Ega, I insisted on burying her with the same honours as a child of the whites ; that is, as an "anjinho" (little angel), according to the pretty Roman Catholic custom of the country. We had the corpse clothed in a robe of fine calico, crossed her hands on her breast over a "palma" of flowers, and made also a crown of flowers for her head. Scores of helpless children like our poor Oria die at Ega, or on the road ; but generally not the slightest care is taken of them during their illness. They are the captives made during the merciless raids of one section of the Miránha tribe on the territories of another, and sold to the Ega traders. The villages of the attacked hordes are surprised, and the men and women killed or driven into the thickets without having time to save their children. There appears to be no doubt that the Miránhas are cannibals, and, therefore, the purchase of these captives probably saves them from a worse fate. The demand for them at Ega operates, however, as a direct cause of the supply, stimulating the unscrupulous chiefs, who receive all the profits to undertake these murderous expeditions.

It is remarkable how quickly the savages of the various nations, which each have their own, to all

appearance, widely different language, learn Tupí on their arrival at Ega, where it is the common idiom. This perhaps may be attributed chiefly to the grammatical forms of all the Indian tongues being the same, although the words are different. As far as I could learn, the feature is common to all, of placing the preposition *after* the noun, making it, in fact, a *post*-position, thus: "he is come the village *from;*" "go him *with*, the plantation *to*," and so forth. The ideas to be expressed in their limited sphere of life and thought are few; consequently the stock of words is extremely small; besides, all Indians have the same way of thinking, and the same objects to talk about; these circumstances also contribute to the ease with which they learn each other's language. Hordes of the same tribe living on the same branch rivers, speak mutually unintelligible languages; this happens with the Miránhas on the Japurá, and with the Collínas on the Jurúa; whilst Tupí is spoken with little corruption along the banks of the main Amazons for a distance of 2500 miles. The purity of Tupí is kept up by frequent communication amongst the natives, from one end to the other of the main river; how complete and long-continued must be the isolation in which the small groups of savages have lived in other parts, to have caused so complete a segregation of dialects! It is probable that the strange inflexibility of the Indian organisation, both bodily and mental, is owing to the isolation in which each small tribe has lived, and to the narrow round of life and thought, and close intermarriages for countless generations, which are the neces-

sary results. Their fecundity is of a low degree, for it is very rare to find an Indian family having so many as four children, and we have seen how great is their liability to sickness and death on removal from place to place.

I have already remarked on the different way in which the climate of this equatorial region affects Indians and negroes. No one could live long amongst the Indians of the Upper Amazons, without being struck with their constitutional dislike to the heat. Europeans certainly withstand the high temperature better than the original inhabitants of the country: I always found I could myself bear exposure to the sun or unusually hot weather, quite as well as the Indians, although not well-fitted by nature for a hot climate. Their skin is always hot to the touch, and they perspire little. No Indian resident of Ega can be induced to stay in the village (where the heat is felt more than in the forest or on the river), for many days together. They bathe many times a day, but do not plunge in the water, taking merely a *sitz-bath*, as dogs may be seen doing in hot climates, to cool the lower parts of the body. The women and children, who often remain at home, whilst the men are out for many days together fishing, generally find some excuse for trooping off to the shades of the forest in the hot hours of the afternoons. They are restless and discontented in fine dry weather, but cheerful in cool days, when the rain is pouring down on their naked backs. When suffering under fever, nothing but strict watching can prevent them going down to bathe in the river, or from eating immoderate quantities of juicy fruits, although

these indulgences are frequently the cause of death. They are very subject to disorders of the liver, dysentery, and other diseases of hot climates, and when any epidemic is about, they fall ill quicker, and suffer more than negroes or even whites. How different all this is with the negro, the true child of tropical climes! The impression gradually forced itself on my mind that the red Indian lives as a stranger, or immigrant in these hot regions, and that his constitution was not originally adapted, and has not since become perfectly adapted to the climate. It is a case of want of fitness; other races of men living on the earth would have been better fitted to enjoy and make use of the rich unappropriated domain. Unlike the lands peopled by Negro and Caucasian, Tropical America had no indigenous man thoroughly suited to its conditions, and was therefore peopled by an ill-suited race from another continent.

The Indian element is very prominent in the amusements of the Ega people. All the Roman Catholic holidays are kept up with great spirit; rude Indian sports being mingled with the ceremonies introduced by the Portuguese. Besides these, the aborigines celebrate their own ruder festivals: the people of different tribes combining; for, in most of their features, the merry-makings were originally alike in all the tribes. The Indian idea of a holiday is bonfires, processions, masquerading, especially the mimicry of different kinds of animals, plenty of confused drumming and fifing, monotonous dancing, kept up hour after hour without intermission, and the most important point of all, getting gradually and completely drunk. But he

attaches a kind of superstitious significance to these acts, and thinks that the amusements appended to the Roman Catholic holidays as celebrated by the descendants of the Portuguese, are also an essential part of the religious ceremonies. But in this respect, the uneducated whites and half-breeds are not a bit more enlightened than the poor dull-souled Indian. All look upon a religious holiday as an amusement, in which the priest takes the part of director or chief actor.

Almost every unusual event, independent of saints' days, is made the occasion of a holiday by the sociable, easy-going people of the white and mameluco classes; funerals, christenings, weddings, the arrival of strangers, and so forth. The custom of "waking" the dead is also kept up. A few days after I arrived, I was awoke in the middle of a dark moist night by Cardozo, to sit up with a neighbour whose wife had just died. I found the body laid out on a table, with crucifix and lighted wax-candles at the head, and the room full of women and girls squatted on stools or on their haunches. The men were seated round the open door, smoking, drinking coffee, and telling stories; the bereaved husband exerting himself much to keep the people merry during the remainder of the night. The Ega people seem to like an excuse for turning night into day; it is so cool and pleasant, and they can sit about during these hours in the open air, clad as usual in simple shirt and trowsers, without streaming with perspiration.

The patron saint is Santa Theresa; the festival at whose anniversary lasts, like most of the others, ten days. It begins very quietly with evening litanies sung in the

church, which are attended by the greater part of the population, all clean and gaily dressed in calicos and muslins ; the girls wearing jasmines and other natural flowers in their hair, no other head-dress being worn by females of any class. The evenings pass pleasantly ; the church is lighted up with wax candles, and illuminated on the outside by a great number of little oil lamps —rude clay cups, or halves of the thick rind of the bitter orange, which are fixed all over the front. The congregation seem very attentive, and the responses to the litany of Our Lady, sung by a couple of hundred fresh female voices, ring agreeably through the still village. Towards the end of the festival the fun commences. The managers of the feast keep open houses, and dancing, drumming, tinkling of wire guitars, and unbridled drinking by both sexes, old and young, are kept up for a couple of days and a night with little intermission. The ways of the people at these merry-makings, of which there are many in the course of the year, always struck me as being not greatly different from those seen at an old-fashioned village wake in retired parts of England. The old folks look on and get very talkative over their cups ; the children are allowed a little extra indulgence in sitting up ; the dull, reserved fellows become loquacious, shake one another by the hand or slap each other on the back, discovering, all at once, what capital friends they are. The cantankerous individual gets quarrelsome, and the amorous unusually loving. The Indian, ordinarily so taciturn, finds the use of his tongue, and gives the minutest details of some little dispute which he had with his master years ago, and which

every one else had forgotten; just as I have known lumpish labouring men in England do, when half-fuddled. One cannot help reflecting, when witnessing these traits of manners, on the similarity of human nature everywhere, when classes are compared whose state of culture and conditions of life are pretty nearly the same.

The Indians play a conspicuous part in the amusements at St. John's eve, and at one or two other holidays which happen about that time of the year—the end of June. In some of the sports the Portuguese element is visible, in others the Indian; but it must be recollected that masquerading, recitative singing, and so forth, are common originally to both peoples. A large number of men and boys disguise themselves to represent different grotesque figures, animals, or persons. Two or three dress themselves up as giants, with the help of a tall framework. One enacts the part of the Caypór, a kind of sylvan deity similar to the Curupíra which I have before mentioned. The belief in this being seems to be common to all the tribes of the Tupí stock. According to the figure they dressed up at Ega, he is a bulky, misshapen monster, with red skin and long shaggy red hair hanging half way down his back. They believe that he has subterranean campos and hunting grounds in the forest, well stocked with pacas and deer. He is not at all an object of worship nor of fear, except to children, being considered merely as a kind of hobgoblin. Most of the masquers make themselves up as animals—bulls, deer, magoary storks, jaguars, and so forth, with the aid of light frameworks

covered with old cloth dyed or painted and shaped according to the object represented. Some of the imitations which I saw were capital. One ingenious fellow arranged an old piece of canvas in the form of a tapir, placed himself under it, and crawled about on all fours. He constructed an elastic nose to resemble that of the tapir, and made, before the doors of the principal residents, such a good imitation of the beast grazing, that peals of laughter greeted him wherever he went. Another man walked about solitarily, masked as a jabirú crane (a large animal standing about four feet high), and mimicked the gait and habits of the bird uncommonly well. One year an Indian lad imitated me, to the infinite amusement of the townsfolk. He came the previous day to borrow of me an old blouse and straw hat. I felt rather taken in when I saw him, on the night of the performance, rigged out as an entomologist, with an insect net, hunting bag, and pincushion. To make the imitation complete, he had borrowed the frame of an old pair of spectacles, and went about with it straddled over his nose. The jaguar now and then made a raid amongst the crowd of boys who were dressed as deer, goats, and so forth. The masquers kept generally together, moving from house to house, and the performances were directed by an old musician, who sang the orders and explained to the spectators what was going forward in a kind of recitative, accompanying himself on a wire guitar. The mixture of Portuguese and Indian customs is partly owing to the European immigrants in these parts having been uneducated men, who, instead of introducing European civilisation, have

descended almost to the level of the Indians, and adopted some of their practices. The performances take place in the evening, and occupy five or six hours; bonfires are lighted along the grassy streets, and the families of the better class are seated at their doors, enjoying the wild but good-humoured fun.

A purely Indian festival is celebrated the first week in February, which is called the Feast of Fruits : several kinds of wild fruit becoming ripe at that time, more particularly the Umarí and the Wishí, two sorts which are a favourite food of the people of this province, although of a bitter taste and unpalatable to Europeans. It takes place at the houses of a few families of the Jurí tribe, hidden in the depths of the forest on the banks of a creek about three miles from Ega. I saw a little of it one year, when hunting in the neighbourhood with an Indian attendant. There were about 150 people assembled, nearly all red-skins, and signs of the orgy having been very rampant the previous night were apparent in the litter and confusion all around, and in the number of drunken men lying asleep under the trees and sheds. The women had manufactured a great quantity of spirits in rude clay stills, from mandioca, bananas, and pine-apples. I doubt whether there was ever much symbolic meaning attached by the aborigines to festivals of this kind. The harvest-time of the Umirí and Wishí is one of their seasons of abundance, and they naturally made it the occasion of one of their mad, drunken holidays. They learnt the art of distilling spirits from the early Portuguese ; it is only, however, one or two of the superior tribes, such as the Jurís and Passés, who

practise it. The Indians of the Upper Amazons, like those of the Lower river, mostly use fermented drinks (called here Caysúma), made from mandioca cakes and different kinds of fruit.

I did not see much fruit about. A few old women in one of the sheds were preparing and cooking porridge of bananas in large earthenware kettles. It was now near midday, the time when a little rest is taken before resuming the orgy in the evening; but a small party of young men and women were keeping up the dance to the accompaniment of drums made of hollow logs and beaten with the hands. The men formed a curved line on the outside, and the women a similar line on the inside facing their partners. Each man had in his right hand a long reed representing a javelin, and rested his left on the shoulders of his neighbour. They all moved, first to the right and then to the left, with a slow step, singing a drawling monotonous verse, in a language which I did not understand. The same figure was repeated in the dreariest possible way for at least half an hour, and in fact constituted the whole of the dance. The assembled crowd included individuals of most of the tribes living in the region around Ega; but the majority were Miránhas and Jurís. They had no common chief, an active middle-aged Jurí, named Alexandro, in the employ of Senhor Chrysostomo of Ega, seeming to have the principal management. This festival of fruits was the only occasion in which the Indians of the neighbourhood assembled together or exhibited any traces of joint action. It declined in importance every year, and will no doubt soon be discontinued altogether.

The trade of Ega, like that of all places on the Upper Amazons, consists in the collecting of the produce of the forests and waters, and exchanging it for European and North American goods. About a dozen large vessels, schooners and cubertas, owned by the merchants of the place, are employed in the traffic. Only one voyage a year is made to Pará, which occupies from four to five months, and is arranged so that the vessels shall return before the height of the dry season, when they are sent with assortments of goods; cloth, hardware, salt, and a few luxuries, such as biscuits, wine, &c., to the fishing stations, to buy up produce for the next trip to the capital. Although large profits are apparently made both ways, the retail prices of European wares being from 40 to 80 per cent. higher, and the net prices of produce to the same degree lower, than those of Pará, the traders do not get rich very rapidly. An old Portuguese who had traded with success at Ega for thirty years was reputed rich when he died: his savings then amounting to nine contos of reis, or about a thousand pounds sterling. The value of produce fluctuates much, and losses are often sustained in consequence. Excessively long credit is given: the system being to trust the collectors of produce with goods a twelvemonth in advance; and if anything happens in the meantime to a customer, the debt is lost altogether.

The articles of export from the upper river are cacao, salsaparilla, Brazil nuts, bast for caulking vessels (the inner bark of various species of Lecythideæ or Brazil-nut trees), copaïba balsam, India-rubber, salt-fish (pirarucú), turtle-oil, mishíra (potted vacca marina), and grass ham-

mocks. The total value of the produce annually exported from Ega, I calculated at from seven to eight thousand pounds sterling. Most of the articles are collected in the forest by the Ega people, who take their families and live in the woods for months at a time, during the proper seasons. Some of the productions, such as salsaparilla and balsam of copaüba, have been long ago exhausted in the neighbourhood of towns, at least near the banks of the rivers, the only parts that have yet been explored, and are now got only by more adventurous traders during long voyages up the branch streams. The search for India-rubber has commenced but very lately; the tree appears to grow plentifully on some of the rivers, but only an insignificant fraction of the immense forest has yet been examined. Grass hammocks are manufactured by the wild tribes, and purchased of them in considerable quantities by the salsaparilla collectors. They are knitted with simple rods, except the larger kinds, which are woven in clumsy wooden looms. The fibre of which they are made is not grass, but the young leaflets of certain kinds of palm trees (Astryocaryum). These are split, and the strips twisted into two or three-strand cord, by rolling them with the fingers on the naked thigh. Salt-fish and mishíra are prepared by the half-breeds and civilized Indians, who establish fishing stations (feitorias) on the great sandbanks laid bare by the retreating waters, in places where fish, turtle, and manatee abound, and spend the whole of the dry season in this occupation. Turtle oil is made from the eggs of the large river turtle, and is one of the principal produc-

tions of the district ; the mode of collecting the eggs and extracting the oil will be described in the next chapter.

I know several men who have been able, with ordinary sobriety and industry, to bring up their families very respectably, and save money at Ega, as collectors of the spontaneous productions of the neighbourhood. Each family, however, besides this trade, has its little plantation of mandioca, coffee, beans, water melons, tobacco, and so forth, which is managed almost solely by the women. Some do not take the trouble to clear a piece of forest for this purpose, but make use of the sloping, bare, earthy banks of the Solimoens, which remain uncovered by water during eight or nine months of the year, and consequently long enough to give time for the ripening of the crops of mandioca, beans, and so forth. The process with regard to mandioca, the bread of the country, is very simple. A party of women take a few bundles of maníva (mandioca shoots) some fine day in July or August, when the river has sunk some few feet, and plant them in the rich alluvial soil, reckoning with the utmost certainty on finding a plentiful crop when they return in January or February. The regular plantations are all situated some distance from Ega, and across the water, nothing being safe on the mainland near the town on account of the cattle, some hundred head of which are kept grazing in the streets by the townsfolk. Every morning, soon after daybreak, the women are seen paddling off in montarias to their daily labours in these *roças* or clearings ; the mistresses of house-

holds with their groups of Indian servant girls. The term agriculture cannot be applied to this business; in this primitive country plough, spade, and hoe are unknown even by name. The people idle away most part of the time at their *roças*, and have no system when they do work, so that a family rarely produces more than is required for its own consumption.

The half-caste and Indian women, after middle age, are nearly all addicted to the use of Ypadú, the powdered leaves of a plant (Erythroxylon coca) which is well known as a product of the eastern parts of Peru, and is to the natives of these regions what opium is to the Turks and betel to the Malays. Persons who indulge in Ypadú at Ega are held in such abhorrence, that they keep the matter as secret as possible; so it is said, and no doubt with truth, that the slender result of the women's daily visits to their *roças*, is owing to their excessive use of this drug. They plant their little plots of the tree in retired nooks in the forest, and keep their stores of the powder in hiding-places near the huts which are built on each plantation. Taken in moderation, Ypadú has a stimulating and not injurious effect, but in excess it is very weakening, destroying the appetite, and producing in time great nervous exhaustion. I once had an opportunity of seeing it made at the house of a Marauá Indian on the banks of the Jutahí. The leaves were dried on a mandioca oven, and afterwards pounded in a very long and narrow wooden mortar. When about half pulverised, a number of the large leaves of the Cecropia palmata (candelabrum tree) were

burnt on the floor, and the ashes dirtily gathered up and mixed with the powder. The Ypadú-eaters say that this prevents the ill-effects which would arise from the use of the pure leaf, but I should think the mixture of so much indigestible filth would be more likely to have the opposite result.

We lived at Ega, during most part of the year, on turtle. The great fresh-water turtle of the Amazons grows on the upper river to an immense size, a full-grown one measuring nearly three feet in length by two in breadth, and is a load for the strongest Indian. Every house has a little pond, called a curral (pen), in the back-yard to hold a stock of the animals through the season of dearth—the wet months; those who have a number of Indians in their employ sending them out for a month when the waters are low, to collect a stock, and those who have not, purchasing their supply; with some difficulty, however, as they are rarely offered for sale. The price of turtles, like that of all other articles of food, has risen greatly with the introduction of steam-vessels. When I arrived in 1850 a middle-sized one could be bought pretty readily for ninepence, but when I left in 1859, they were with difficulty obtained at eight and nine shillings each. The abundance of turtles, or rather the facility with which they can be found and caught, varies with the amount of annual subsidence of the waters. When the river sinks less than the average, they are scarce; but when more, they can be caught in plenty, the bays and shallow lagoons in the forest having then only a small depth of water. The flesh is very tender, palatable, and wholesome; but it is very cloy-

ing: every one ends, sooner or later, by becoming thoroughly surfeited. I became so sick of turtle in the course of two years that I could not bear the smell of it, although at the same time nothing else was to be had, and I was suffering actual hunger. The native women cook it in various ways. The entrails are chopped up and made into a delicious soup called *sarapatel*, which is generally boiled in the concave upper shell of the animal used as a kettle. The tender flesh of the breast is partially minced with farinha, and the breast shell then roasted over the fire, making a very pleasant dish. Steaks cut from the breast and cooked with the fat form another palatable dish. Large sausages are made of the thick-coated stomach, which is filled with minced meat and boiled. The quarters cooked in a kettle of Tucupí sauce form another variety of food. When surfeited with turtle in all other shapes, pieces of the lean part roasted on a spit and moistened only with vinegar make an agreeable change. The smaller kind of turtle, the tracajá, which makes its appearance in the main river, and lays its eggs a month earlier than the large species, is of less utility to the inhabitants although its flesh is superior, on account of the difficulty of keeping it alive; it survives captivity but a very few days, although placed in the same ponds in which the large turtle keeps well for two or three years.

Those who cannot hunt and fish for themselves, and whose stomachs refuse turtle, are in a poor way at Ega. Fish, including many kinds of large and delicious salmonidæ, is abundant in the fine season; but each

family fishes only for itself, and has no surplus for sale. An Indian fisherman remains out just long enough to draw what he thinks sufficient for a couple of days' consumption. Vacca marina is a great resource in the wet season ; it is caught by harpooning, which requires much skill, or by strong nets made of very thick hammock twine, and placed across narrow inlets. Very few Europeans are able to eat the meat of this animal. Although there is a large quantity of cattle in the neighbourhood of the town, and pasture is abundant all the year round, beef can be had only when a beast is killed by accident. The most frequent cause of death is poisoning by drinking raw Tucupí, the juice of the mandioca root. Bowls of this are placed on the ground in the sheds where the women prepare farinha; it is generally done carelessly, but sometimes intentionally through spite when stray oxen devastate the plantations of the poorer people. The juice is almost certain to be drunk if cattle stray near the place, and death is the certain result. The owners kill a beast which shows symptoms of having been poisoned, and retail the beef in the town. Although every one knows it cannot be wholesome, such is the scarcity of meat and the uncontrollable desire to eat beef, that it is eagerly bought, at least by those residents who come from other provinces where beef is the staple article of food. Game of all kinds is scarce in the forest near the town, except in the months of June and July, when immense numbers of a large and handsome bird, Cuvier's toucan (Ramphastos Cuvieri) make their appearance. They come in well-fed condition, and are shot in such quantities that

every family has the strange treat of stewed and roasted toucans daily for many weeks. Curassow birds are plentiful on the banks of the Solimoens, but to get a brace or two requires the sacrifice of several days for the trip. A tapir, of which the meat is most delicious and nourishing, is sometimes killed by a fortunate hunter. I have still a lively recollection of the pleasant effects which I once experienced from a diet of fresh tapir meat for a few days, after having been brought to a painful state of bodily and mental depression by a month's scanty rations of fish and farinha.

We sometimes had fresh bread at Ega made from American flour brought from Pará, but it was sold at ninepence a pound. I was once two years without tasting wheaten bread, and attribute partly to this the gradual deterioration of health which I suffered on the Upper Amazons. Mandioca meal is a poor, weak substitute for bread; it is deficient in gluten, and consequently cannot be formed into a leavened mass or loaf, but is obliged to be roasted in hard grains in order to keep any length of time. Cakes are made of the half-roasted meal, but they become sour in a very few hours. A superior kind of meal is manufactured at Ega of the sweet mandioca (Manihot Aypi); it is generally made with a mixture of the starch of the root, and is therefore a much more wholesome article of food than the ordinary sort which, on the Amazons, is made of the pulp after the starch has been extracted by soaking in water. When we could get neither bread nor biscuit, I found tapioca soaked in coffee the best native substitute. We were seldom

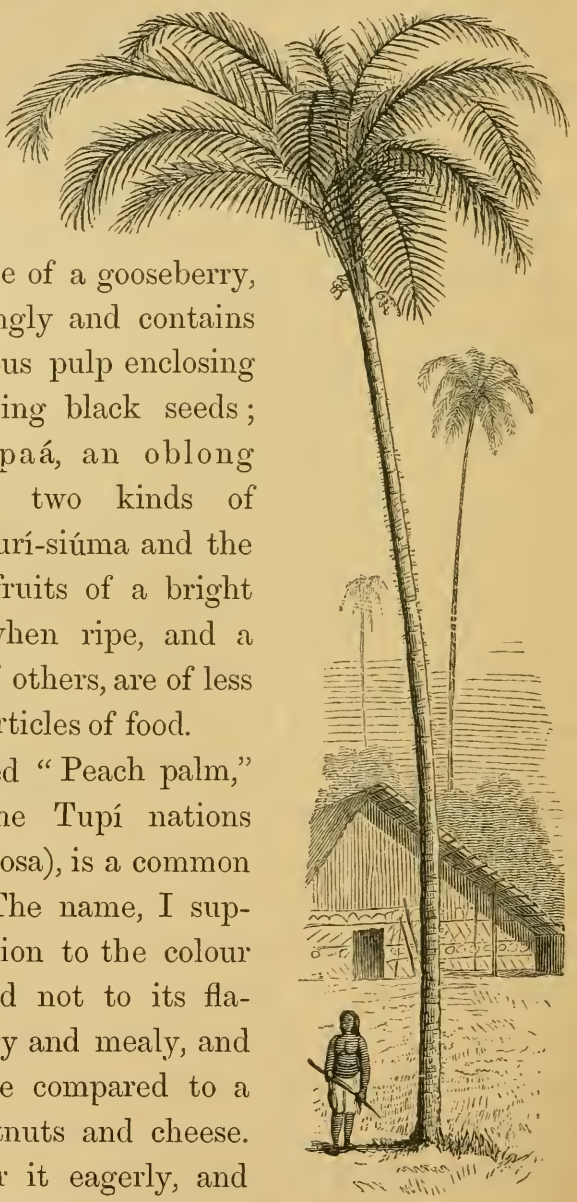
without butter, as every canoe brought one or two casks on each return voyage from Pará, where it is imported in considerable quantity from Liverpool. We obtained tea in the same way; it being served as a fashionable luxury at wedding and christening parties; the people were at first strangers to this article, for they used to stew it in a saucepan, mixing it up with coarse raw sugar, and stirring it with a spoon. Sometimes we had milk, but this was only when a cow calved; the yield from each cow was very small, and lasted only for a few weeks in each case, although the pasture is good, and the animals are sleek and fat.

Fruit of the ordinary tropical sorts could generally be had. I was quite surprised at the variety of the wild kinds, and of the delicious flavour of some of them. Many of these are utterly unknown in the regions nearer the Atlantic; being the peculiar productions of this highly-favoured, and little known, interior country. Some have been planted by the natives in their clearings. The best was the *Jabutí-púhe*, or tortoise-foot; a scaled fruit probably of the Anonaceous order. It is about the size of an ordinary apple; when ripe the rind is moderately thin, and encloses, with the seeds, a quantity of custardy pulp of a very rich flavour. Next to this stands the Cumá (Collophora sp.) of which there are two species, not unlike, in appearance, small round pears; but the rind is rather hard, and contains a gummy milk, and the pulpy part is almost as delicious as that of the Jabuti-púhe. The Cumá tree is of moderate height, and grows rather plentifully in the

more elevated and drier situations. A third kind is the Pamá, which is a stone-fruit, similar in colour and appearance to the cherry, but of oblong shape. The tree is one of the loftiest in the forest, and has never, I believe, been selected for cultivation. To get at the fruit the natives are obliged to climb to the height of about a hundred feet, and cut off the heavily laden branches. I have already mentioned the Umarí and the Wishí: both these are now cultivated. The fatty, bitter pulp which surrounds the large stony seeds of these fruits is eaten mixed with farinha, and is very nourishing. Another cultivated fruit is the Purumá (Puruma cecropiæfolia, Martius), a round juicy berry, growing in large bunches and resembling grapes in taste. The tree is deceptively like a Cecropia in the shape of its foliage. Another smaller kind, called Purumá-i, grows wild in the forest close to Ega, and has not yet been planted. The most singular of all these fruits is the Uikí, which is of oblong shape, and grows apparently crosswise on the end of its stalk. When ripe the thick green rind opens by a natural cleft across the middle, and discloses an oval seed the size of a damascene plum, but of a vivid crimson colour. This bright hue belongs to a thin coating of pulp which, when the seeds are mixed in a plate of stewed bananas, gives to the mess a pleasant rosy tint, and a rich creamy taste and consistence. *Mingau* (porridge) of bananas

Uikí Fruit.

flavoured and coloured with Uikí is a favourite dish at Ega. The fruit, like most of the others here mentioned, ripens in January. Many smaller fruits such as Wajurú (probably a species of Achras), the size of a gooseberry, which grows singly and contains a sweet gelatinous pulp enclosing two large, shining black seeds; Cashipári-arapaá, an oblong scarlet berry; two kinds of Bacurí, the Bacurí-siúma and the B. curúa, sour fruits of a bright lemon colour when ripe, and a great number of others, are of less importance as articles of food.



Pupunha Palm.

The celebrated "Peach palm," *Pupunha* of the Tupí nations (Guilielma speciosa), is a common tree at Ega. The name, I suppose, is in allusion to the colour of the fruit, and not to its flavour, for it is dry and mealy, and in taste may be compared to a mixture of chestnuts and cheese. Vultures devour it eagerly, and come in quarrelsome flocks to the trees when it is ripe. Dogs will also eat it: I

do not recollect seeing cats do the same, although they go voluntarily to the woods to eat Tucumá, another kind of palm fruit. The tree, as it grows in clusters beside the palm-thatched huts, is a noble ornament, being, when full grown, from fifty to sixty feet in height and often as straight as a scaffold-pole. A bunch of fruit when ripe is a load for a strong man, and each tree bears several of them. The Pupunha grows wild nowhere on the Amazons. It is one of those few vegetable productions (including three kinds of mandioca and the American species of Banana) which the Indians have cultivated from time immemorial, and brought with them in their original migration to Brazil. It is only, however, the more advanced tribes who have kept up the cultivation. The superiority of the fruit on the Solimoens to that grown on the Lower Amazons and in the neighbourhood of Pará is very striking. At Ega it is generally as large as a full-sized peach, and when boiled almost as mealy as a potatoe; whilst at Pará it is no bigger than a walnut, and the pulp is fibrous. Bunches of sterile or seedless fruits sometimes occur in both districts. It is one of the principal articles of food at Ega when in season, and is boiled and eaten with treacle or salt. A dozen of the seedless fruits makes a good nourishing meal for a grown-up person. It is the general belief that there is more nutriment in Pupunha than in fish or Vacca marina.

The seasons in the Upper Amazons region offer some points of difference from those of the lower river and the district of Pará, which two sections of the country

we have already seen also differ considerably. The year at Ega is divided according to the rises and falls of the river, with which coincide the wet and dry periods. All the principal transactions of life of the inhabitants are regulated by these yearly recurring phenomena. The peculiarity of this upper region consists in there being two rises and two falls within the year. The great annual rise commences about the end of February, and continues to the middle of June, during which the rivers and lakes, confined during the dry periods to their ordinary beds, gradually swell and overflow all the lower lands. The inundation progresses gently inch by inch, and is felt everywhere, even in the interior of the forests of the higher lands, miles away from the river; as these are traversed by numerous gullies, forming in the fine season dry, spacious dells, which become gradually transformed by the pressure of the flood into broad creeks navigable by small boats under the shade of trees. All the countless swarms of turtle of various species then leave the main river for the inland pools: the sand-banks go under water, and the flocks of wading birds migrate northerly to the upper waters of the tributaries which flow from that direction, or to the Orinoco; which streams during the wet period of the Amazons are enjoying the cloudless skies of their dry season. The families of fishermen who have been employed, during the previous four or five months, in harpooning and salting pirarucú and shooting turtle in the great lakes, now return to the towns and villages; their temporarily constructed fishing establishments becoming gradually submerged, with the sand islets or

beaches on which they were situated. This is the season, however, in which the Brazil nut and wild cacao ripen, and many persons go out to gather these harvests, remaining absent generally throughout the months of March and April. The rains during this time are not continuous; they fall very heavily at times, but rarely last so long at a stretch as twenty-four hours, and many days intervene of pleasant, sunny weather. The sky, however, is generally overcast and gloomy, and sometimes a drizzling rain falls.

About the first week in June the flood is at its highest; the water being then about forty-five feet above its lowest point; but it varies in different years to the extent of about fifteen feet. The "enchente," or flow, as it is called by the natives, who believe this great annual movement of the waters to be of the same nature as the tide towards the mouth of the Amazons, is then completed, and all begin to look forward to the "vasante," or ebb. The provision made for the dearth of the wet season is by this time pretty nearly exhausted; fish is difficult to procure, and many of the less provident inhabitants have become reduced to a diet of fruits and farinha porridge.

The fine season begins with a few days of brilliant weather—furious, hot sun, with passing clouds. Idle men and women, tired of the dulness and confinement of the flood season, begin to report, on returning from their morning bath, the cessation of the flow: *as agoas estaõ paradas*, "the waters have stopped." The muddy streets, in a few days, dry up: groups of young fellows are now seen seated on the shady sides of the cottages

making arrows and knitting fishing-nets with tucúm twine ; others are busy patching up and caulking their canoes, large and small: in fact, preparations are made on all sides for the much longed-for "veraō," or summer, and the "migration," as it is called, of fish and turtle ; that is, their descent from the inaccessible pools in the forest to the main river. Towards the middle of July the sand-banks begin to reappear above the surface of the waters, and with this change come flocks of sandpipers and gulls, which latter make known the advent of the fine season, as the cuckoo does of the European spring ; uttering almost incessantly their plaintive cries as they fly about over the shallow waters of sandy shores. Most of the gaily-plumaged birds have now finished moulting, and begin to be more active in the forest.

The fall continues to the middle of October, with the interruption of a partial rise called "repiquet," of a few inches in the midst of very dry weather in September, caused by the swollen contribution of some large affluent higher up the river. The amount of subsidence also varies considerably, but it is never so great as to interrupt navigation by large vessels. The greater it is the more abundant is the season. Every one is prosperous when the waters are low ; the shallow bays and pools being then crowded with the concentrated population of fish and turtle. All the people, men, women, and children, leave the villages and spend the few weeks of glorious weather rambling over the vast undulating expanses of sand in the middle of the Solimoens, fishing, hunting, collecting eggs of turtle and plovers,

and thoroughly enjoying themselves. The inhabitants pray always for a "vasante grande," or great ebb.

From the middle of October to the beginning of January, the second wet season prevails. The rise is sometimes not more than about fifteen feet, but it is, in some years, much more considerable, laying the large sand islands under water before the turtle eggs are hatched. In one year, whilst I resided at Ega, this second annual inundation reached to within ten feet of the highest water point as marked by the stains on the trunks of trees by the river side.

The second dry season comes on in January, and lasts throughout February. The river sinks sometimes to the extent of a few feet only, but one year (1856) I saw it ebb to within about five feet of its lowest point in September. This is called the summer of the Umarí, "Veraõ do Umarí," after the fruit of this name already described, which ripens at this season. When the fall is great, this is the best time to catch turtles. In the year above mentioned, nearly all the residents who had a canoe, and could work a paddle, went out after them in the month of February, and about 2000 were caught in the course of a few days. It appears that they had been arrested in their migration towards the interior pools of the forest by the sudden drying up of the water-courses, and so had become easy prey.

Thus the Ega year is divided into four seasons; two of dry weather and falling waters, and two of the reverse. Besides this variety, there is, in the month of May, a short season of very cold weather, a most surprising circumstance in this otherwise uniformly swel-

tering climate. This is caused by the continuance of a cold wind, which blows from the south over the humid forests that extend without interruption from north of the equator to the eighteenth parallel of latitude in Bolivia. I had, unfortunately, no thermometer with me at Ega; the only one I brought with me from England having been lost at Pará. The temperature is so much lowered, that fishes die in the river Teffé, and are cast in considerable quantities on its shores. One year I saw and examined numbers of these benumbed and dead fishes. They were all small fry of different species of Characini. The wind is not strong; but it brings cloudy weather, and lasts from three to five or six days in each year. The inhabitants all suffer much from the cold, many of them wrapping themselves up with the warmest clothing they can get (blankets are here unknown), and shutting themselves in-doors with a charcoal fire lighted. I found, myself, the change of temperature most delightful, and did not require extra clothing. It was a bad time, however, for my pursuit, as birds and insects all betook themselves to places of concealment, and remained inactive. The period during which this wind prevails is called the "tempo da friagem," or the season of coldness. The phenomenon, I presume, is to be accounted for by the fact that in May it is winter in the southern temperate zone, and that the cool currents of air travelling thence northwards towards the equator, become only moderately heated in their course, owing to the intermediate country being a vast, partially-flooded plain, covered with humid forests.

## CHAPTER IV.

### EXCURSIONS IN THE NEIGHBOURHOOD OF EGA.

The river Teffé—Rambles through groves on the beach—Excursion to the house of a Passé chieftain—Character and customs of the Passé tribe—First excursion to the sand islands of the Solimoens—Habits of great river-turtle—Second excursion—Turtle-fishing in the inland pools—Third excursion—Hunting-rambles with natives in the forest—Return to Ega.

I WILL now proceed to give some account of the more interesting of my shorter excursions in the neighbourhood of Ega. The incidents of the longer voyages, which occupied each several months, will be narrated in a separate chapter.

The settlement, as before described, is built on a small tract of cleared land at the lower or eastern end of the lake, six or seven miles from the main Amazons, with which the lake communicates by a narrow channel. On the opposite shore of the broad expanse stands a small village, called Nogueira, the houses of which are not visible from Ega, except on very clear days; the coast on the Nogueira side is high, and stretches away into the grey distance towards the south-west. The upper part of the river Teffé is not visited by the Ega people, on account of its extreme unhealthiness, and its

barrenness in salsaparilla and other wares. To Europeans it will seem a most surprising thing that the people of a civilised settlement, 170 years old, should still be ignorant of the course of the river on whose banks their native place, for which they proudly claim the title of city, is situated. It would be very difficult for a private individual to explore it, as the necessary number of Indian paddlers could not be obtained. I knew only one person who had ascended the Teffé to any considerable distance, and he was not able to give me a distinct account of the river. The only tribe known to live on its banks are the Catauishís, a people who perforate their lips all round, and wear rows of slender sticks in the holes: their territory lies between the Purús and the Juruá, embracing both shores of the Teffé. A very considerable stream, the Bararuá, enters the lake from the west, about thirty miles above Ega; the breadth of the lake is much contracted a little below the mouth of this tributary, but it again expands further south, and terminates abruptly where the Teffé proper, a narrow river with a strong current, forms its head water.

The whole of the country for hundreds of miles is covered with picturesque but pathless forests, and there are only two roads along which excursions can be made by land from Ega. One is a narrow hunter's track, about two miles in length, which traverses the forest in the rear of the settlement. The other is an extremely pleasant path along the beach to the west of the town. This is practicable only in the dry season, when a flat strip of white sandy beach is exposed at the

foot of the high wooded banks of the lake, covered with trees, which, as there is no underwood, form a spacious shady grove. I rambled daily, during many weeks of each successive dry season, along this delightful road. The trees, many of which are myrtles (Eugenia Egaensis of Martius) and wild Guavas (Psidium), with smooth yellow stems, were in flower at this time; and the rippling waters of the lake, under the cool shade, everywhere bordered the path. The place was the resort of kingfishers, green and blue tree-creepers, purple-headed tanagers, and humming-birds. Birds generally, however, were not numerous. Every tree was tenanted by Cicadas, the reedy notes of which produced that loud, jarring, insect music which is the general accompaniment of a woodland ramble in a hot climate. One species was very handsome, having wings adorned with patches of bright green and scarlet. It was very common; sometimes three or four tenanting a single tree, clinging as usual to the branches. On approaching a tree thus peopled, a number of little jets of a clear liquid would be seen squirted from aloft. I have often received the well-directed discharge full on my face; but the liquid is harmless, having a sweetish taste, and is ejected by the insect from the anus, probably in self-defence, or from fear. The number and variety of gaily-tinted butterflies, sporting about in this grove on sunny days, were so great that the bright moving flakes of colour gave quite a character to the physiognomy of the place. It was impossible to walk far without disturbing flocks of them from the damp sand at the edge of the water, where they congregated to imbibe the moisture. They

were of almost all colours, sizes, and shapes: I noticed here altogether eighty species, belonging to twenty-two different genera. It is a singular fact that, with very few exceptions, all the individuals of these various species thus sporting in sunny places were of the male sex; their partners, which are much more soberly dressed and immensely less numerous than the males, being confined to the shades of the woods. Every afternoon, as the sun was getting low, I used to notice these gaudy sunshine-loving swains trooping off to the forest, where I suppose they would find their sweethearts and wives. The most abundant, next to the very common sulphur-yellow and orange-coloured kinds (Callidryas, seven species), were about a dozen species of Cybdelis, which are of large size, and are conspicuous from their liveries of glossy dark-blue and purple. A superbly-adorned creature, the Callithea Markii, having wings of a thick texture, coloured sapphire-blue and orange, was only an occasional visitor. On certain days, when the weather was very calm, two small gilded-green species (Symmachia Trochilus and Colubris) literally swarmed on the sands, their glittering wings lying wide open on the flat surface. The beach terminates, eight miles beyond Ega, at the mouth of a rivulet; the character of the coast then changes, the river banks being masked by a line of low islets amid a labyrinth of channels.

In all other directions my very numerous excursions were by water; the most interesting of those made in the immediate neighbourhood were to the houses of Indians on the banks of retired creeks; an account of one of these trips will suffice.

On the 23rd of May, 1850, I visited, in company with Antonio Cardozo, the Delegado, a family of the Passé tribe, who live near the head waters of the igarapé, which flows from the south into the Teffé, entering it at Ega. The creek is more than a quarter of a mile broad near the town, but a few miles inland it gradually contracts, until it becomes a mere rivulet flowing through a broad dell in the forest. When the river rises it fills this dell; the trunks of the lofty trees then stand many feet deep in the water, and small canoes are able to travel the distance of a day's journey under the shade, regular paths or alleys being cut through the branches and lower trees. This is the general character of the country of the Upper Amazons; a land of small elevation and abruptly undulated, the hollows forming narrow valleys in the dry months, and deep navigable creeks in the wet months. In retired nooks on the margins of these shady rivulets, a few families or small hordes of aborigines still linger in nearly their primitive state, the relicts of their once numerous tribes. The family we intended to visit on this trip was that of Pedro-uassú (Peter the Great, or Tall Peter), an old chieftain or Tushaúa of the Passés.

We set out at sunrise, in a small igarité, manned by six young Indian paddlers. After travelling about three miles along the broad portion of the creek—which, being surrounded by woods, had the appearance of a large pool—we came to a part where our course seemed to be stopped by an impenetrable hedge of trees and bushes. We were some time before finding the entrance, but when fairly within the shades, a remarkable

scene presented itself. It was my first introduction to these singular water-paths. A narrow and tolerably straight alley stretched away for a long distance before us; on each side were the tops of bushes and young trees, forming a kind of border to the path, and the trunks of the tall forest trees rose at irregular intervals from the water, their crowns interlocking far over our heads, and forming a thick shade. Slender air roots hung down in clusters, and looping sipós dangled from the lower branches; bunches of grass, tillandsiæ, and ferns, sat in the forks of the larger boughs, and the trunks of trees near the water had adhering to them round dried masses of freshwater sponges. There was no current perceptible, and the water was stained of a dark olive-brown hue, but the submerged stems could be seen through it to a great depth. We travelled at good speed for three hours along this shady road; the distance of Pedro's house from Ega being about twenty miles. When the paddlers rested for a time, the stillness and gloom of the place became almost painful: our voices waked dull echoes as we conversed, and the noise made by fishes occasionally whipping the surface of the water was quite startling. A cool, moist, clammy air pervaded the sunless shade.

The breadth of the wooded valley, at the commencement, is probably more than half a mile, and there is a tolerably clear view for a considerable distance on each side of the water-path through the irregular colonnade of trees: other paths also, in this part, branch off right and left from the principal road, leading to the scattered houses of Indians on the mainland. The

dell contracts gradually towards the head of the rivulet, and the forest then becomes denser; the water-path also diminishes in width, and becomes more winding, on account of the closer growth of the trees. The boughs of some are stretched forth at no great height over one's head, and are seen to be loaded with epiphytes; one orchid I noticed particularly, on account of its bright yellow flowers growing at the end of flower-stems several feet long. Some of the trunks, especially those of palms, close beneath their crowns, were clothed with a thick mass of glossy shield-shaped Pothos plants, mingled with ferns. Arrived at this part we were, in fact, in the heart of the virgin forest. We heard no noises of animals in the trees, and saw only one bird, the sky-blue chatterer, sitting alone on a high branch. For some distance the lower vegetation was so dense that the road runs under an arcade of foliage, the branches having been cut away only sufficiently to admit of the passage of a small canoe. These thickets are formed chiefly of Bamboos, whose slender foliage and curving stems arrange themselves in elegant, feathery bowers: but other social plants,—slender green climbers with tendrils so eager in aspiring to grasp the higher boughs that they seem to be endowed almost with animal energy, and certain low trees having large elegantly-veined leaves, contribute also to the jungly masses. Occasionally we came upon an uprooted tree lying across the path, its voluminous crown still held up by thick cables of sipó, connecting it with standing trees: a wide circuit had to be made in these cases, and it was sometimes difficult to find the right path again.

At length we arrived at our journey's end. We were then in a very dense and gloomy part of the forest: we could see, however, the dry land on both sides of the creek, and to our right a small sunny opening appeared, the landing-place to the native dwellings. The water was deep close to the bank, and a clean pathway ascended from the shady port to the buildings, which were about a furlong distant. My friend Cardozo was godfather to a grandchild of Pedro-uassú, whose daughter had married an Indian settled in Ega. He had sent word to the old man that he intended to visit him: we were therefore expected.

As we landed, Pedro-uassú himself came down to the port to receive us; our arrival having been announced by the barking of dogs. He was a tall and thin old man, with a serious, but benignant expression of countenance, and a manner much freer from shyness and distrust than is usual with Indians. He was clad in a shirt of coarse cotton cloth, dyed with murishí, and trowsers of the same material turned up to the knee. His features were sharply delineated—more so than in any Indian face I had yet seen; the lips thin and the nose rather high and compressed. A large, square, blue-black tattooed patch occupied the middle of his face, which, as well as the other exposed parts of his body, was of a light reddish-tan colour, instead of the usual coppery-brown hue. He walked with an upright, slow gait, and on reaching us saluted Cardozo with the air of a man who wished it to be understood that he was dealing with an equal. My friend introduced me, and I was welcomed in the same grave, ceremonious manner.

He seemed to have many questions to ask : but they were chiefly about Senhora Felippa, Cardozo's Indian housekeeper at Ega, and were purely complimentary. This studied politeness is quite natural to Indians of the advanced agricultural tribes. The language used was Tupí : I heard no other spoken all the day. It must be borne in mind that Pedro-uassú had never had much intercourse with whites : he was, although baptised, a primitive Indian, who had always lived in retirement ; the ceremony of baptism having been gone through, as it generally is by the aborigines, simply from a wish to stand well with the whites.

Arrived at the house, we were welcomed by Pedro's wife : a thin, wrinkled, active old squaw, tattooed in precisely the same way as her husband. She had also sharp features, but her manner was more cordial and quicker than that of her husband : she talked much, and with great inflection of voice ; whilst the tones of the old man were rather drawling and querulous. Her clothing was a long petticoat of thick cotton cloth, and a very short chemise, not reaching to her waist. I was rather surprised to find the grounds around the establishment in neater order than in any sitio, even of civilised people, I had yet seen on the Upper Amazons : the stock of utensils and household goods of all sorts was larger, and the evidences of regular industry and plenty more numerous than one usually perceives in the farms of civilised Indians and whites. The buildings were of the same construction as those of the humbler settlers in all other parts of the country. The family lived in a large, oblong, open shed built under the

shade of trees. Two smaller buildings, detached from the shed and having mud-walls with low doorways, contained apparently the sleeping apartment of different members of the large household. A small mill for grinding sugar-cane, having two cylinders of hard notched wood ; wooden troughs, and kettles for boiling the *guarápa* (cane juice), to make treacle, stood under a separate shed, and near it was a large enclosed mud-house for poultry. There was another hut and shed a short distance off, inhabited by a family dependent on Pedro, and a narrow pathway through the luxuriant woods led to more dwellings of the same kind. There was an abundance of fruit trees around the place, including the never-failing banana, with its long, broad, soft green leaf-blades, and groups of full-grown Pupúnhas, or peach palms. There was also a large number of cotton and coffee trees. Amongst the utensils I noticed baskets of different shapes, made of flattened maranta stalks, and dyed various colours. The making of these is an original art of the Passés, but I believe it is also practised by other tribes, for I saw several in the houses of semi-civilised Indians on the Tapajos.

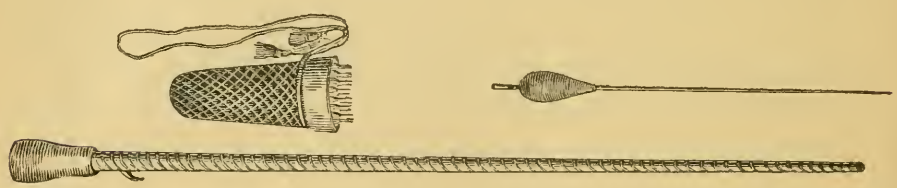
There were only three persons in the house besides the old couple, the rest of the people being absent ; several came in, however, in the course of the day. One was a daughter of Pedro's, who had an oval tattooed spot over her mouth ; the second was a young grandson ; and the third the son-in-law from Ega, Cardozo's *compadre*. The old woman was occupied, when we entered, in distilling spirits from cará, an eatable root similar to the

potato, by means of a clay still, which had been manufactured by herself. The liquor had a reddish tint, but not a very agreeable flavour. A cup of it warm from the still, however, was welcome after our long journey. Cardozo liked it, emptied his cup, and replenished it in a very short time. The old lady was very talkative, and almost fussy in her desire to please her visitors. We sat in tucúm hammocks, suspended between the upright posts of the shed. The young woman with the blue mouth—who, although married, was as shy as any young maiden of her race—soon became employed in scalding and plucking fowls for the dinner, near the fire on the ground at the other end of the dwelling. The son-in-law, Pedro-uassú, and Cardozo now began a long conversation on the subject of their deceased wife, daughter, and *comadre.** It appeared she had died of consumption—"tisica," as they called it, a word adopted by the Indians from the Portuguese. The widower repeated over and over again, in nearly the same words, his account of her illness, Pedro chiming in like a chorus, and Cardozo moralising and condoling. I thought the *cauím* (grog) had a good deal to do with the flow of talk and warmth of feeling of all three: the widower drank and wailed until he became maundering, and finally fell asleep.

I left them talking, and went a long ramble into the forest, Pedro sending his grandson, a smiling well-behaved lad of about fourteen years of age, to show me the paths, my companion taking with him his *Zaraba-*

* Co-mother; the term expressing the relationship of a mother to the godfather of her child.

*tana*, or blowpipe. This instrument is used by all the Indian tribes on the Upper Amazons. It is generally nine or ten feet long, and is made of two separate lengths of wood, each scooped out so as to form one half of the tube. To do this with the necessary accuracy requires an enormous amount of patient labour, and considerable mechanical ability, the tools used being simply the incisor teeth of the Páca and Cutía. The two half tubes, when finished, are secured together by a very close and tight spirally-wound strapping, consisting of long flat strips of Jacitára, or the wood of the climbing palm-tree; and the whole is smeared afterwards with



Blow-pipe, quiver, and arrow.

black wax, the production of a Melipona bee. The pipe tapers towards the muzzle, and a cup-shaped mouthpiece, made of wood, is fitted in the broad end. A full-sized *Zarabatana* is heavy, and can only be used by an adult Indian who has had great practice. The young lads learn to shoot with smaller and lighter tubes. When Mr. Wallace and I had lessons at Barra in the use of the blowpipe, of Julio, a Jurí Indian, then in the employ of Mr. Hauxwell, an English bird-collector, we found it very difficult to hold steadily the long tubes. The arrows are made from the hard rind of the leaf-stalks of certain palms, thin strips being cut, and

rendered as sharp as needles by scraping the ends with a knife or the tooth of an animal. They are winged with a little oval mass of samaüma silk (from the seed-vessels of the silk-cotton tree, Eriodendron samaüma), cotton being too heavy. The ball of samaüma should fit to a nicety the bore of the blowpipe; when it does so, the arrow can be propelled with such force by the breath that it makes a noise almost as loud as a pop-gun on flying from the muzzle. My little companion was armed with a quiver full of these little missiles, a small number of which, sufficient for the day's sport, were tipped with the fatal Urarí poison. The quiver was an ornamental affair, the broad rim being made of highly-polished wood of a rich cherry-red colour (the Moira-piránga, or red-wood of the Japurá). The body was formed of neatly-plaited strips of Maranta stalks, and the belt by which it was suspended from the shoulder was decorated with cotton fringes and tassels.

We walked about two miles along a well-trodden pathway, through high caäpoeira (second-growth forest). A large proportion of the trees were Melastomas, which bore a hairy yellow fruit, nearly as large and as well flavoured as our gooseberry. The season, however, was nearly over for them. The road was bordered every inch of the way by a thick bed of elegant Lycopodiums. An artificial arrangement of trees and bushes could scarcely have been made to wear so finished an appearance as this naturally decorated avenue. The path at length terminated at a plantation of mandioca, the largest I had yet seen since I left the neighbourhood of Pará. There were probably ten acres of

cleared land, and part of the ground was planted with Indian corn, water-melons, and sugar-cane. Beyond this field there was only a faint hunter's track, leading towards the untrodden interior. My companion told me he had never heard of there being any inhabitants in that direction (the south). We crossed the forest from this place to another smaller clearing, and then walked, on our road home, through about two miles of caäpoeira of various ages, the sites of old plantations. The only fruits of our ramble were a few rare insects and a Japú (Cassicus cristatus), a handsome bird with chestnut and saffron-coloured plumage, which wanders through the tree-tops in large flocks. My little companion brought this down from a height which I calculated at thirty yards. The blowpipe, however, in the hands of an expert adult Indian, can be made to propel arrows so as to kill at a distance of fifty and sixty yards. The aim is most certain when the tube is held vertically, or nearly so. It is a far more useful weapon in the forest than a gun, for the report of a firearm alarms the whole flock of birds or monkeys feeding on a tree, whilst the silent poisoned dart brings the animals down one by one until the sportsman has a heap of slain by his side. None but the stealthy Indian can use it effectively. The poison, which must be fresh to kill speedily, is obtained only of the Indians who live beyond the cataracts of the rivers flowing from the north, especially the Rio Negro and the Japurá. Its principal ingredient is the wood of the Strychnos toxifera, a tree which does not grow in the humid forests of the river plains. A most graphic account of the Urarí, and of an expedition

undertaken in search of the tree in Guiana, has been given by Sir Robert Schomburgk.*

When we returned to the house after mid-day, Cardozo was still sipping cauím, and now looked exceedingly merry. It was fearfully hot: the good fellow sat in his hammock with a cuya full of grog in his hands; his broad honest face all of a glow, and the perspiration streaming down his uncovered breast, the unbuttoned shirt having slipped half-way over his broad shoulders. Pedro-uassú had not drunk much; he was noted, as I afterwards learnt, for his temperance. But he was standing up as I had left him two hours previous, talking to Cardozo in the same monotonous tones, the conversation apparently not having flagged all the time. I had never heard so much talking amongst Indians. The widower was asleep: the stirring, managing old lady with her daughter were preparing dinner. This, which was ready soon after I entered, consisted of boiled fowls and rice, seasoned with large green peppers and lemon juice, and piles of new, fragrant farinha and raw bananas. It was served on plates of English manufacture on a tupé, or large plaited rush mat, such as is made by the natives pretty generally on the Amazons. Three or four other Indians, men and women of middle age, now made their appearance, and joined in the meal. We all sat round on the floor: the women, according to custom, not eating until after the men had done. Before sitting down, our host apologised in his usual quiet, courteous manner for not having knives and forks; Cardozo and I ate by the aid of wooden

* Annals and Magazine of Natural History, vol. vii. p. 411.

spoons, the Indians using their fingers. The old man waited until we were all served before he himself commenced. At the end of the meal, one of the women brought us water in a painted clay basin of Indian manufacture, and a clean but coarse cotton napkin, that we might wash our hands.

The horde of Passés of which Pedro-uassú was Tushaúa or chieftain, was at this time reduced to a very small number of individuals. The disease mentioned in the last chapter had for several generations made great havoc amongst them; many, also, had entered the service of whites at Ega, and, of late years, intermarriages with whites, half-castes, and civilised Indians had been frequent. The old man bewailed the fate of his race to Cardozo with tears in his eyes. "The people of my nation," he said, "have always been good friends to the Caríwas (whites), but before my grandchildren are old like me the name of Passé will be forgotten." In so far as the Passés have amalgamated with European immigrants or their descendants, and become civilised Brazilian citizens, there can scarcely be ground for lamenting their extinction as a nation; but it fills one with regret to learn how many die prematurely of a disease which seems to arise on their simply breathing the same air as the whites. The original territory of the tribe must have been of large extent, for Passés are said to have been found by the early Portuguese colonists on the Rio Negro; an ancient settlement on that river, Barcellos, having been peopled by them when it was first established; and they formed also part of the original population of Fonte-boa on the Solimoens. Their

hordes were therefore spread over a region 400 miles in length from east to west. It is probable, however, that they have been confounded by the colonists with other neighbouring tribes who tattoo their faces in a similar manner; such as the Jurís, Uáinumás, Shumánas, Araúas, and Tucúnas. The extinct tribe of Yurimaúas, or Sorimóas, from which the river Solimoens derives its name, according to traditions extant at Ega, resembled the Passés in their slender figures and friendly disposition. These tribes (with others lying between them) peopled the banks of the main river and its by-streams from the mouth of the Rio Negro to Peru. True Passés existed in their primitive state on the banks of the Issá, 240 miles to the west of Ega, within the memory of living persons. The only large body of them now extant are located on the Japurá, at a place distant about 150 miles from Ega: the population of this horde, however, does not exceed, from what I could learn, 300 or 400 persons. I think it probable that the lower part of the Japurá and its extensive delta lands formed the original home of this gentle tribe of Indians.

The Passés are always spoken of in this country as the most advanced of all the Indian nations in the Amazons region. I saw altogether about thirty individuals of the tribe, and found them generally distinguishable from other Indians by their lighter colour, sharper features, and more open address. But these points of distinction were not invariable, for I saw individuals of the Jurí and Miránha tribes from the Upper Japurá; of the Catoquínos, who inhabit the banks of the Jurúa, 300 miles from its mouth; and

of the Tucúnas of St. Paulo, who were scarcely distinguishable from Passés in all the features mentioned. It is remarkable that a small tribe, the Caishánas, who live in the very midst of all these superior tribes, are almost as debased physically and mentally as the Múras, the lowest of all the Indian tribes on the Amazons. Yet were they seen separately, many Caishánas could not be distinguished from Miránhas or Jurís, although none have such slender figures or are so frank in their ways as to be mistaken for Passés. I make these remarks to show that the differences between the nations or tribes of Indians are not absolute, and therefore that there is no ground for supposing any of them to have had an origin entirely different from the rest. Under what influences certain tribes, such as the Passés, have become so strongly modified in mental, social, and bodily features, it is hard to divine. The industrious habits, fidelity, and mildness of disposition of the Passés, their docility and, it may be added, their personal beauty, especially of the children and women, made them from the first very attractive to the Portuguese colonists. They were, consequently, enticed in great number from their villages and brought to Barra and other settlements of the whites. The wives of governors and military officers from Europe were always eager to obtain children for domestic servants: the girls being taught to sew, cook, weave hammocks, manufacture pillow-lace, and so forth. They have been generally treated with kindness, especially by the educated families in the settlements. It is pleasant to have to record that I never heard of a deed of violence perpetrated, on

the one side or the other, in the dealings between European settlers and this noble tribe of savages.

Very little is known of the original customs of the Passés. The mode of life of our host Pedro-uassú did not differ much from that of the civilised Mamelucos; but he and his people showed a greater industry, and were more open, cheerful, and generous in their dealings than many half-castes. The authority of Pedro, like that of the Tushaúas generally, was exercised in a mild manner. These chieftains appear able to command the services of their subjects, since they furnish men to the Brazilian authorities when requested; but none of them, even those of the most advanced tribes, appear to make use of this authority for the accumulation of property; the service being exacted chiefly in time of war. Had the ambition of the chiefs of some of these industrious tribes been turned to the acquisition of wealth, probably we should have seen indigenous civilised nations in the heart of South America similar to those found on the Andes of Peru and Mexico. It is very probable that the Passés adopted from the first to some extent the manners of the whites. Ribeiro, a Portuguese official who travelled in these regions in 1774-5, and wrote an account of his journey, relates that they buried their dead in large earthenware vessels (a custom still observed amongst other tribes on the Upper Amazons), and that, as to their marriages, the young men earned their brides by valiant deeds in war. He also states that they possessed a cosmogony, in which the belief that the sun was a fixed body with the earth revolving around it, was a prominent feature. He says, moreover, that

they believed in a Creator of all things; a future state of rewards and punishments, and so forth. These notions are so far in advance of the ideas of all other tribes of Indians, and so little likely to have been conceived and perfected by a people having no written language or leisured class, that we must suppose them to have been derived by the docile Passés from some early missionary or traveller. I never found that the Passés had more curiosity or activity of intellect than other Indians. No trace of a belief in a future state exists amongst Indians who have not had much intercourse with the civilised settlers, and even amongst those who have it is only a few of the more gifted individuals who show any curiosity on the subject. Their sluggish minds seem unable to conceive or feel the want of a theory of the soul, and of the relations of man to the Creator or the rest of Nature. But is it not so with totally uneducated and isolated people even in the most highly civilised parts of the world? The good qualities of the Passés belong to the moral part of the character: they lead a contented, unambitious, and friendly life, a quiet, domestic, orderly existence, varied by occasional drinking bouts and summer excursions. They are not so shrewd, energetic, and masterful as the Mundurucús, but they are more easily taught, because their disposition is more yielding than that of the Mundurucús or any other tribe.

We started on our return to Ega at half-past four o'clock in the afternoon. Our generous entertainers loaded us with presents. There was scarcely room for us to sit in the canoe, as they had sent down ten large bundles

of sugar-cane, four baskets of farinha, three cedar planks, a small hamper of coffee, and two heavy bunches of bananas. After we were embarked the old lady came with a parting gift for me—a huge bowl of smoking-hot banana porridge. I was to eat it on the road "to keep my stomach warm." Both stood on the bank as we pushed off, and gave us their adeos, "Ikuána Tupána eirúm" (Go with God): a form of salutation taught by the old Jesuit missionaries. We had a most uncomfortable passage, for Cardozo was quite tipsy and had not attended to the loading of the boat. The cargo had been placed too far forward, and to make matters worse my heavy friend obstinately insisted on sitting astride on the top of the pile, instead of taking his place near the stern; singing from his perch a most indecent love-song, and disregarding the inconvenience of having to bend down almost every minute to pass under the boughs and hanging sipós as we sped rapidly along. The canoe leaked, but not, at first, alarmingly. Long before sunset, darkness began to close in under these gloomy shades, and our steersman could not avoid now and then running the boat into the thicket. The first time this happened a piece was broken off the square prow (rodella); the second time we got squeezed between two trees. A short time after this latter accident, being seated near the stern with my feet on the bottom of the boat, I felt rather suddenly the cold water above my ankles. A few minutes more and we should have sunk, for a seam had been opened forward under the pile of sugar-cane. Two of us began to bale, and by the most strenuous efforts managed to keep afloat with-

out throwing overboard our cargo. The Indians were obliged to paddle with extreme slowness to avoid shipping water, as the edge of our prow was nearly level with the surface; but Cardozo was now persuaded to change his seat. The sun set, the quick twilight passed, and the moon soon after began to glimmer through the thick canopy of foliage. The prospect of being swamped in this hideous solitude was by no means pleasant, although I calculated on the chance of swimming to a tree and finding a nice snug place in the fork of some large bough wherein to pass the night. At length, after four hours' tedious progress, we suddenly emerged on the open stream where the moonlight glittered in broad sheets on the gently rippling waters. A little extra care was now required in paddling. The Indians plied their strokes with the greatest nicety; the lights of Ega (the oil lamps in the houses) soon appeared beyond the black wall of forest, and in a short time we leapt safely ashore.

A few months after the excursion just narrated, I accompanied Cardozo in many wanderings on the Solimoens, during which we visited the praias (sand-islands), the turtle pools in the forests, and the by-streams and lakes of the great desert river. His object was mainly to superintend the business of digging up turtle eggs on the sand-banks, having been elected commandante for the year, by the municipal council of Ega, of the "praia real" (royal sand-island) of Shimuní, the one lying nearest to Ega. There are four of these royal praias within the Ega district, (a distance of 150 miles

from the town), all of which are visited annually by the Ega people for the purpose of collecting eggs and extracting oil from their yolks. Each has its commander, whose business is to make arrangements for securing to every inhabitant an equal chance in the egg harvest by placing sentinels to protect the turtles whilst laying, and so forth. The pregnant turtles descend from the interior pools to the main river in July and August, before the outlets dry up, and then seek in countless swarms their favourite sand-islands; for it is only a few praias that are selected by them out of the great number existing. The young animals remain in the pools throughout the dry season. These breeding places of turtles then lie twenty to thirty or more feet above the level of the river, and are accessible only by cutting roads through the dense forest.

We left Ega on our first trip, to visit the sentinels whilst the turtles were yet laying, on the 26th of September. Our canoe was a stoutly-built igarité, arranged for ten paddlers, and having a large arched toldo at the stern, under which three persons could sleep pretty comfortably. In passing down the narrow channel to the mouth of the Teffé, I noticed that the yellow waters of the Solimoens were flowing slowly inwards towards the lake, showing how much fuller and stronger, at this season, was the current of the main river than that of its tributary. On reaching the broad stream, we descended rapidly on the swift current to the south-eastern or lower end of the large wooded island of Bariá, which here divides the river into two great channels. The distance was about twelve miles: the island

of Shimuní lies in the middle of the north-easterly channel, and is reached by passing round the end of Bariá. Two miles further down the broad, wild, and turbid river, lies the small island of Curubarú, skirted like the others by a large praia ; this is not, however, frequented by turtles, on account of the coarse, gritty nature of the deposit. The sand-banks appear to be formed only where there is a remanso or still water, and the wooded islands to which they are generally attached probably first originated in accumulations of sand.

We landed on Curubarú ; Cardozo wishing to try the poços (wells, or deep pools) which lie here as in other praias between the sand-bank and its island, for fish and tracajás. The sun was now nearly vertical, and the coarse, heated sand burnt our feet as we trod. We walked or rather trotted nearly a mile before reaching the pools : there was not a breath of wind nor a cloud to moderate the heat of mid-day, and the Indians who carried the fishing-net suffered greatly. On arriving at the ponds we found the water was quite warm ; the net brought up only two or three small fishes, and we thus had our toilsome journey for nothing.

Re-embarking, we paddled across to Shimuní, reaching the commencement of the praia an hour before sunset. The island-proper is about three miles long and half a mile broad : the forest with which it is covered rises to an immense and uniform height, and presents all round a compact, impervious front. Here and there a singular tree, called Pao mulatto (mulatto wood), with polished dark-green trunk, rose conspicuously amongst

the mass of vegetation. The sand-bank, which lies at the upper end of the island extends several miles, and presents an irregular, and in some parts, strongly waved surface, with deep hollows and ridges. When upon it, one feels as though treading an almost boundless field of sand: for towards the south-east, where no forest-line terminates the view, the white, rolling plain stretches away to the horizon. The north-easterly channel of the river lying between the sands and the further shore of the river is at least two miles in breadth; the middle one, between the two islands, Shimuní and Bariá, is not much less than a mile.

We found the two sentinels lodged in a corner of the praia, where it commences at the foot of the towering forest-wall of the island; having built for themselves a little rancho with poles and palm-leaves. Great precautions are obliged to be taken to avoid disturbing the sensitive turtles, who, previous to crawling ashore to lay, assemble in great shoals off the sand-bank. The men, during this time, take care not to show themselves and warn off any fisherman who wishes to pass near the place. Their fires are made in a deep hollow near the borders of the forest, so that the smoke may not be visible. The passage of a boat through the shallow waters where the animals are congregated, or the sight of a man or a fire on the sand-bank, would prevent the turtles from leaving the water that night to lay their eggs, and if the causes of alarm were repeated once or twice, they would forsake the praia for some other quieter place. Soon after we arrived, our men were sent with the net to catch a supply of fish for supper. In half an hour,

four or five large basketsful of Acarí were brought in. The sun set soon after our meal was cooked; we were then obliged to extinguish the fire and remove our supper materials to the sleeping ground, a spit of sand about a mile off; this course being necessary on account of the mosquitoes which swarm at night on the borders of the forest.

One of the sentinels was a taciturn, morose-looking, but sober and honest Indian, named Daniel; the other was a noted character of Ega, a little wiry mameluco, named Carepíra (Fish-hawk); known for his waggery, propensity for strong drink, and indebtedness to Ega traders. Both were intrepid canoemen and huntsmen, and both perfectly at home anywhere in these fearful wastes of forest and water. Carepíra had his son with him, a quiet little lad of about nine years of age. These men in a few minutes constructed a small shed with four upright poles and leaves of the arrow-grass, under which I and Cardozo slung our hammocks. We did not go to sleep, however, until after midnight: for when supper was over we lay about on the sand with a flask of rum in our midst, and whiled away the still hours in listening to Carepíra's stories.

I rose from my hammock by daylight, shivering with cold; a praia, on account of the great radiation of heat in the night from the sand, being towards the dawn the coldest place that can be found in this climate. Cardozo and the men were already up watching the turtles. The sentinels had erected for this purpose a stage about fifty feet high, on a tall tree near their station, the ascent to which was by a roughly-made ladder of woody

lianas. They are enabled, by observing the turtles from this watch-tower, to ascertain the date of successive deposits of eggs, and thus guide the commandante in fixing the time for the general invitation to the Ega people. The turtles lay their eggs by night, leaving the water when nothing disturbs them, in vast crowds, and crawling to the central and highest part of the praia. These places are, of course, the last to go under water when, in unusually wet seasons, the river rises before the eggs are hatched by the heat of the sand. One could almost believe, from this, that the animals used forethought in choosing a place; but it is simply one of those many instances in animals where unconscious habit has the same result as conscious prevision. The hours between midnight and dawn are the busiest. The turtles excavate with their broad, webbed paws deep holes in the fine sand: the first comer, in each case, making a pit about three feet deep, laying its eggs (about 120 in number) and covering them with sand; the next making its deposit at the top of that of its predecessor, and so on until every pit is full. The whole body of turtles frequenting a praia does not finish laying in less than fourteen or fifteen days, even when there is no interruption. When all have done, the area (called by the Brazilians *taboleiro*) over which they have excavated, is distinguishable from the rest of the praia only by signs of the sand having been a little disturbed.

On rising I went to join my friends. Few recollections of my Amazonian rambles are more vivid and agreeable than that of my walk over the white sea of

sand on this cool morning. The sky was cloudless ; the just-risen sun was hidden behind the dark mass of woods on Shimuní, but the long line of forest to the west, on Bariá, with its plumy decorations of palms, was lighted up with his yellow, horizontal rays. A faint chorus of singing birds reached the ears from across the water, and flocks of gulls and plovers were crying plaintively over the swelling banks of the praia, where their eggs lay in nests made in little hollows of the sand. Tracks of stray turtles were visible on the smooth white surface of the praia. The animals which thus wander from the main body are lawful prizes of the sentinels ; they had caught in this way two before sunrise, one of which we had for dinner. In my walk I disturbed several pairs of the chocolate and drab-coloured wild goose (Anser jubatus) which set off to run along the edge of the water. The enjoyment one feels in rambling over these free, open spaces, is no doubt enhanced by the novelty of the scene, the change being very great from the monotonous landscape of forest which everywhere else presents itself.

On arriving at the edge of the forest I mounted the sentinel's stage, just in time to see the turtles retreating to the water on the opposite side of the sand-bank, after having laid their eggs. The sight was well worth the trouble of ascending the shaky ladder. They were about a mile off, but the surface of the sands was blackened with the multitudes which were waddling towards the river ; the margin of the praia was rather steep, and they all seemed to tumble head first down the declivity into the water.

I spent the morning of the 27th collecting insects in the woods of Shimuní; assisting my friend in the afternoon to beat a large pool for Tracajás, Cardozo wishing to obtain a supply for his table at home. The pool was nearly a mile long, and lay on one side of the island between the forest and the sand-bank. The sands are heaped up very curiously around the margins of these isolated sheets of water; in the present case they formed a steeply-inclined bank, from five to eight feet in height. What may be the cause of this formation I cannot imagine. The pools always contain a quantity of imprisoned fish, turtles, tracajás, and Aiyussás.* The turtles and Aiyussás crawl out voluntarily in the course of a few days, and escape to the main river, but the Tracajás remain and become an easy prey to the natives. The ordinary mode of obtaining them is to whip the water in every part with rods for several hours during the day; this treatment having the effect of driving the animals out. They wait, however, until the night following the beating before making their exit. Our Indians were occupied for many hours in this work, and when night came they and the sentinels were placed at intervals along the edge of the water to be ready to capture the runaways. Cardozo and I, after supper, went and took our station at one end of the pool.

We did not succeed, after all our trouble, in getting many Tracajás. This was partly owing to the intense darkness of the night, and partly, doubtless, to the

* Specimens of this species of turtle are named in the British Museum collection, Podocnemis expansa.

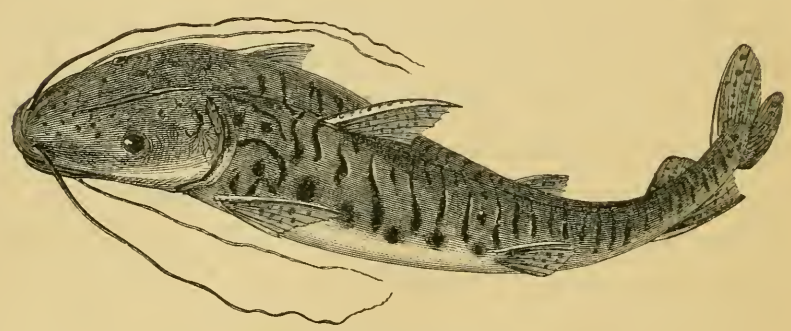
sentinels having already nearly exhausted the pool, notwithstanding their declarations to the contrary. In waiting for the animals it was necessary to keep silence : not a pleasant way of passing the night ; speaking only in whispers, and being without fire in a place liable to be visited by a prowling jaguar. Cardozo and I sat on a sandy slope with our loaded guns by our side, but it was so dark we could scarcely see each other. Towards midnight a storm began to gather around us. The faint wind which had breathed from over the water since the sun went down, ceased ; thick clouds piled themselves up, until every star was obscured, and gleams of watery lightning began to play in the midst of the black masses. I hinted to Cardozo that I thought we had now had enough of watching, and suggested a cigarette. Just then a quick pattering movement was heard on the sands, and grasping our guns, we both started to our feet. Whatever it might have been it seemed to pass by, and a few moments afterwards a dark body appeared to be moving in another direction on the opposite slope of the sandy ravine where we lay. We prepared to fire, but luckily took the precaution of first shouting "Quem va lá?" (Who goes there?). It turned out to be the taciturn sentinel, Daniel, who asked us mildly whether we had heard a "raposa" pass our way. The raposa is a kind of wild dog, with very long, tapering muzzle, and black and white speckled hair.*

* I had once only an opportunity of examining a specimen of this animal. It is probably new to science, at least I have not been able to find a published description that suits the species. The one mentioned was taken from a burrow in the earth in the forests bordering the Teffé, near Ega.

Daniel could distinguish all kinds of animals in the dark by their footsteps. It now began to thunder, and our position was getting very uncomfortable. Daniel had not seen anything of the other Indians, and thought it was useless waiting any longer for Tracajás; we therefore sent him to call in the whole party, and made off, ourselves, as quickly as we could for the canoe. The rest of the night was passed most miserably; as indeed were very many of my nights on the Solimoens. A furious squall burst upon us; the wind blew away the cloths and mats we had fixed up at the ends of the arched awning of the canoe to shelter ourselves, and the rain beat right through our sleeping-place. There we lay, Cardozo and I, huddled together and wet through, waiting for the morning.

A cup of strong and hot coffee put us to rights at sunrise; but the rain was still coming down, having changed to a steady drizzle. Our men were all returned from the pool, having taken only four Tracajás. The business which had brought Cardozo hither being now finished, we set out to return to Ega, leaving the sentinels once more to their solitude on the sands. Our return route was by the rarely frequented north-easterly channel of the Solimoens, through which flows part of the waters of its great tributary stream, the Japurá. We travelled for five hours along the desolate, broken, timber-strewn shore of Bariá. The channel is of immense breadth, the opposite coast being visible only as a long, low line of forest. At three o'clock in the afternoon we doubled the upper end of the island, and then crossed towards the mouth of the Teffé by a broad transverse

channel running between Bariá and another island called Quanarú. There is a small sand-bank at the north-westerly point of Bariá, called Jacaré; we stayed here to dine and afterwards fished with the net. A fine rain was still falling, and we had capital sport, in three hauls taking more fish than our canoe would conveniently hold. They were of two kinds only, the



Surubim (Pimelodus tigrinus).

Surubim and the Piraepiéüa (species of Pimelodus), very handsome fishes four feet in length, with flat spoon-shaped heads, and prettily-spotted and striped skins.

On our way from Jacaré to the mouth of the Teffé we had a little adventure with a black tiger or jaguar. We were paddling rapidly past a long beach of dried mud, when the Indians became suddenly excited, shouting "Ecuí Jauareté; Jauarí-pixúna!" (Behold the jaguar, the black jaguar!). Looking ahead we saw the animal quietly drinking at the water's edge. Cardozo ordered the steersman at once to put us ashore. By the time we were landed the tiger had seen us, and was retracing his steps towards the forest. On the spur of the

moment and without thinking of what we were doing, we took our guns (mine was a double-barrel, with one charge of B B and one of dust-shot) and gave chase. The animal increased his speed, and reaching the forest border dived into the dense mass of broad-leaved grass which formed its frontage. We peeped through the gap he had made, but, our courage being by this time cooled, did not think it wise to go into the thicket after him. The black tiger appears to be more abundant than the spotted form of jaguar in the neighbourhood of Ega. The most certain method of finding it is to hunt, assisted by a string of Indians shouting and driving the game before them, in the narrow *restingas* or strips of dry land in the forest, which are isolated by the flooding of their neighbourhood in the wet season. We reached Ega by eight o'clock at night.

On the 6th of October we left Ega on a second excursion; the principal object of Cardozo being, this time, to search certain pools in the forest for young turtles. The exact situation of these hidden sheets of water is known only to a few practised huntsmen; we took one of these men with us from Ega, a mameluco named Pedro, and on our way called at Shimuní for Daniel to serve as an additional guide. We started from the praia at sunrise on the 7th, in two canoes containing twenty-three persons, nineteen of whom were Indians. The morning was cloudy and cool, and a fresh wind blew from down river, against which we had to struggle with all the force of our paddles, aided by the current; the boats were tossed about most disagreeably, and

shipped a great deal of water. On passing the lower end of Shimuní, a long reach of the river was before us, undivided by islands; a magnificent expanse of water stretching away to the south-east. The country on the left bank is not, however, terra firma, but a portion of the alluvial land which forms the extensive and complex delta region of the Japurá. It is flooded every year at the time of high water, and is traversed by many narrow and deep channels which serve as outlets to the Japurá, or, at least, are connected with that river by means of the interior water-system of the Cupiyó. This inhospitable tract of country extends for several hundred miles, and contains in its midst an endless number of pools and lakes tenanted by multitudes of turtles, fishes, alligators, and water serpents. Our destination was a point on this coast situated about twenty miles below Shimuní, and a short distance from the mouth of the Ananá, one of the channels just alluded to as connected with the Japurá. After travelling for three hours in mid-stream we steered for the land and brought to under a steeply-inclined bank of crumbly earth, shaped into a succession of steps or terraces, marking the various halts which the waters of the river make in the course of subsidence. The coast line was nearly straight for many miles, and the bank averaged about thirty feet in height above the present level of the river: at the top rose the unbroken hedge of forest. No one could have divined that pools of water existed on that elevated land. A narrow level space extended at the foot of the bank. On landing the first business was to get breakfast. Whilst a couple of Indian lads were

employed in making the fire, roasting the fish, and boiling the coffee, the rest of the party mounted the bank, and with their long hunting-knives commenced cutting a path through the forest ; the pool, called the Aningal, being about half a mile distant. After breakfast a great number of short poles were cut and laid crosswise on the path, and then three light montarias which we had brought with us were dragged up the bank by lianas, and rolled away to be embarked on the pool. A large net, seventy yards in length, was then disembarked and carried to the place. The work was done very speedily, and when Cardozo and I went to the spot at eleven o'clock we found some of the older Indians, including Pedro and Daniel, had begun their sport. They were mounted on little stages called moutás, made of poles and cross-pieces of wood secured with lianas, and were shooting the turtles, as they came near the surface, with bows and arrows. The Indians seemed to think that netting the animals, as Cardozo proposed doing, was not lawful sport, and wished first to have an hour or two's old-fashioned practice with their weapons.

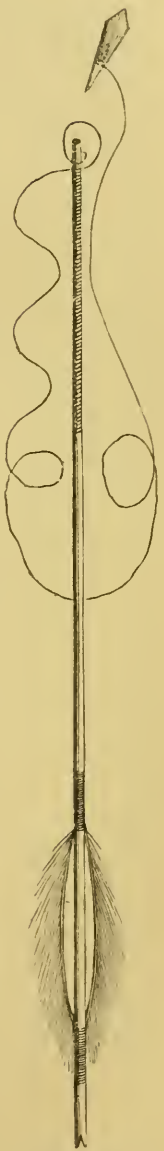
The pool covered an area of about four or five acres, and was closely hemmed in by the forest, which in picturesque variety and grouping of trees and foliage exceeded almost everything I had yet witnessed. The margins for some distance were swampy, and covered with large tufts of a fine grass called Matupá. These tufts in many places were overrun with ferns, and exterior to them a crowded row of arborescent arums, growing to a height of fifteen or twenty feet, formed a

green palisade. Around the whole stood the taller forest trees; palmate-leaved Cecropiæ; slender Assai palms, thirty feet high, with their thin feathery heads crowning the gently-curving, smooth stems; small fan-leaved palms; and as a back-ground to all these airy shapes, lay the voluminous masses of ordinary forest trees, with garlands, festoons, and streamers of leafy climbers hanging from their branches. The pool was nowhere more than five feet deep, one foot of which was not water, but extremely fine and soft mud.

Cardozo and I spent an hour paddling about. I was astonished at the skill which the Indians display in shooting turtles. They did not wait for their coming to the surface to breathe, but watched for the slight movements in the water, which revealed their presence underneath. These little tracks on the water are called the Sirirí; the instant one was perceived an arrow flew from the bow of the nearest man, and never failed to pierce the shell of the submerged animal. When the turtle was very distant, of course the aim had to be taken at a considerable elevation, but the marksmen preferred a longish range, because the arrow then fell more perpendicularly on the shell, and entered it more deeply.

The arrow used in turtle shooting has a strong lancet-shaped steel point, fitted into a peg which enters the tip of the shaft. The peg is secured to the shaft by twine made of the fibres of pine-apple leaves, the twine being some thirty or forty yards in length, and neatly wound round the body of the arrow. When the missile enters the shell the peg drops out, and the pierced

animal descends with it towards the bottom, leaving the shaft floating on the surface. This being done the sportsman paddles in his montaria to the place, and gently draws the animal by the twine, humouring it by giving it the rein when it plunges, until it is brought again near the surface, when he strikes it with a second arrow. With the increased hold given by the two cords he has then no difficulty in landing his game.



Arrow used in turtle shooting.

By mid-day the men had shot about a score of nearly full-grown turtles. Cardozo then gave orders to spread the net. The spongy, swampy nature of the banks made it impossible to work the net so as to draw the booty ashore; another method was therefore adopted. The net was taken by two Indians and extended in a curve at one extremity of the oval-shaped pool, holding it when they had done so by the perpendicular rods fixed at each end; its breadth was about equal to the depth of the water, its shotted side therefore rested on the bottom, whilst the floats buoyed it up on the surface, so that the whole, when the ends were brought together, would form a complete trap. The rest of the party then spread themselves around the swamp at the opposite end of the pool and began to beat, with stout poles, the thick tufts

of Matupá, in order to drive the turtles towards the middle. This was continued for an hour or more, the beaters gradually drawing nearer to each other, and driving the host of animals before them; the number of little snouts constantly popping above the surface of the water showing that all was going on well. When they neared the net the men moved more quickly, shouting and beating with great vigour. The ends of the net were then seized by several strong hands and dragged suddenly forwards, bringing them at the same time together, so as to enclose all the booty in a circle. Every man now leapt into the enclosure, the boats were brought up, and the turtles easily captured by the hand and tossed into them. I jumped in along with the rest, although I had just before made the discovery that the pool abounded in ugly, red, four-angled leeches, having seen several of these delectable animals, which sometimes fasten on the legs of fishermen, although they did not, on this day, trouble us, working their way through cracks in the bottom of our montaria. Cardozo, who remained with the boats, could not turn the animals on their backs fast enough, so that a great many clambered out and got free again. However, three boatloads, or about eighty, were secured in about twenty minutes. They were then taken ashore, and each one secured by the men tying the legs with thongs of bast.

When the canoes had been twice filled, we desisted, after a very hard day's work. Nearly all the animals were young ones, chiefly, according to the statement of Pedro, from three to ten years of age; they varied from six to eighteen inches in length, and were very fat. Car-

dozo and I lived almost exclusively on them for several months afterwards. Roasted in the shell they form a most appetizing dish. These younger turtles never migrate with their elders on the sinking of the waters, but remain in the tepid pools, fattening on fallen fruits, and, according to the natives, on the fine nutritious mud. We captured a few full-grown mother-turtles, which were known at once by the horny skin of their breast-plates being worn, telling of their having crawled on the sands to lay eggs the previous year. They had evidently made a mistake in not leaving the pool at the proper time, for they were full of eggs, which, we were told, they would, before the season was over, scatter in despair over the swamp. We also found several male turtles, or Capitarís, as they are called by the natives. These are immensely less numerous than the females, and are distinguishable by their much smaller size, more circular shape, and the greater length and thickness of their tails. Their flesh is considered unwholesome, especially to sick people having external signs of inflammation. All diseases in these parts, as well as their remedies and all articles of food, are classed by the inhabitants as "hot" and "cold," and the meat of the Capitarí is settled by unanimous consent as belonging to the "hot" list.

We dined on the banks of the river, a little before sunset. The mosquitoes then began to be troublesome, and finding it would be impossible to sleep here, we all embarked and crossed the river to a sand-bank, about three miles distant, where we passed the night. Cardozo and I slept in our hammocks slung between upright

poles, the rest stretching themselves on the sand round a large fire. We lay awake conversing until past midnight. It was a real pleasure to listen to the stories told by one of the older men, they were given with so much spirit. The tales always related to struggles with some intractable animal—jaguar, manatee, or alligator. Many interjections and expressive gestures were used, and at the end came a sudden "Pa! terra!" when the animal was vanquished by a shot or a blow. Many mysterious tales were recounted about the Bouto, as the large Dolphin of the Amazons is called. One of them was to the effect that a Bouto once had the habit of assuming the shape of a beautiful woman, with hair hanging loose to her heels, and walking ashore at night in the streets of Ega, to entice the young men down to the water. If any one was so much smitten as to follow her to the water-side, she grasped her victim round the waist and plunged beneath the waves with a triumphant cry. No animal in the Amazons region is the subject of so many fables as the Bouto; but it is probable these did not originate with the Indians but with the Portuguese colonists. It was several years before I could induce a fisherman to harpoon Dolphins for me as specimens, for no one ever kills these animals voluntarily, although their fat is known to yield an excellent oil for lamps. The superstitious people believe that blindness would result from the use of this oil in lamps. I succeeded at length with Carepira, by offering him a high reward when his finances were at a very low point; but he repented of his deed ever afterwards, declaring that his luck had forsaken him from that day.

TURTLE-FISHING AND ADVENTURE WITH ALLIGATOR.

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The next day we again beat the pool. Although we had proof of there being a great number of turtles yet remaining, we had very poor success. The old Indians told us it would be so, for the turtles were "ladino" (cunning), and would take no notice of the beating a second day. When the net was formed into a circle, and the men had jumped in, an alligator was found to be inclosed. No one was alarmed, the only fear expressed being that the imprisoned beast would tear the net. First one shouted, "I have touched his head;" then another, "he has scratched my leg;" one of the men, a lanky Miránha, was thrown off his balance, and then there was no end to the laughter and shouting. At last a youth of about fourteen years of age, on my calling to him, from the bank, to do so, seized the reptile by the tail, and held him tightly until, a little resistance being overcome, he was able to bring it ashore. The net was opened, and the boy slowly dragged the dangerous but cowardly beast to land through the muddy water, a distance of about a hundred yards. Meantime, I had cut a strong pole from a tree, and as soon as the alligator was drawn to solid ground, gave him a smart rap with it on the crown of his head, which killed him instantly. It was a good-sized individual; the jaws being considerably more than a foot long, and fully capable of snapping a man's leg in twain. The species was the large cayman, the Jacaré-uassú of the Amazonian Indians (Jacare nigra).

On the third day we sent our men in the boats to net turtles in another larger pool, about five miles further down the river, and on the fourth returned to Ega.

It will be well to mention here a few circumstances relative to the large Cayman, which, with the incident just narrated, afford illustrations of the cunning, cowardice and ferocity of this reptile.

I have hitherto had but few occasions of mentioning alligators, although they exist by myriads in the waters of the Upper Amazons. Many different species are spoken of by the natives. I saw only three, and of these two only are common: one, the Jacaré-tinga, a small kind (five feet long when full grown) having a long slender muzzle and a black-banded tail; the other, the Jacaré-uassú, to which these remarks more especially relate; and the third the Jacaré-curúa, mentioned in a former chapter. The Jacaré-uassú, or large Cayman, grows to a length of eighteen or twenty feet, and attains an enormous bulk. Like the turtles, the alligator has its annual migrations, for it retreats to the interior pools and flooded forests in the wet season, and descends to the main river in the dry season. During the months of high water, therefore, scarcely a single individual is to be seen in the main river. In the middle part of the Lower Amazons, about Obydos and Villa Nova, where many of the lakes with their channels of communication with the trunk stream, dry up in the fine months, the alligator buries itself in the mud and becomes dormant, sleeping till the rainy season returns. On the Upper Amazons, where the dry season is never excessive, it has not this habit, but is lively all the year round. It is scarcely exaggerating to say that the waters of the Solimoens are as well-stocked with large alligators in the dry season, as a

ditch in England is in summer with tadpoles. During a journey of five days which I once made in the Upper Amazons steamer, in November, alligators were seen along the coast almost every step of the way, and the passengers amused themselves, from morning till night, by firing at them with rifle and ball. They were very numerous in the still bays, where the huddled crowds jostled together, to the great rattling of their coats of mail, as the steamer passed.

The natives at once despise and fear the great cayman. I once spent a month at Caiçara, a small village of semi-civilised Indians, about twenty miles to the west of Ega. My entertainer, the only white in the place, and one of my best and most constant friends, Senhor Innocencio Alves Faria, one day proposed a half-day's fishing with net in the lake,—the expanded bed of the small river on which the village is situated. We set out in an open boat with six Indians and two of Innocencio's children. The water had sunk so low that the net had to be taken out into the middle by the Indians, whence at the first draught, two medium-sized alligators were brought to land. They were disengaged from the net and allowed, with the coolest unconcern, to return to the water, although the two children were playing in it, not many yards off. We continued fishing, Innocencio and I lending a helping hand, and each time drew a number of the reptiles of different ages and sizes, some of them Jacaré-tingas; the lake in fact, swarmed with alligators. After taking a very large quantity of fish (I took pains to count the different species, and found there were no less than

thirty-five), we prepared to return, and the Indians, at my suggestion, secured one of the alligators with the view of letting it loose amongst the swarms of dogs in the village. An individual was selected about eight feet long: one man holding his head and another his tail, whilst a third took a few lengths of a flexible liana, and deliberately bound the jaws and the legs. Thus secured, the beast was laid across the benches of the boat, on which we sat during the hour and a half's journey to the settlement. We were rather crowded, but our amiable passenger gave us no trouble during the transit. On reaching the village, we took the animal into the middle of the green, in front of the church, where the dogs were congregated, and there gave him his liberty, two of us arming ourselves with long poles to intercept him if he should make for the water, and the others exciting the dogs. The alligator showed great terror, although the dogs could not be made to advance, and made off at the top of its speed for the water, waddling like a duck. We tried to keep him back with the poles, but he became enraged, and seizing the end of the one I held, in his jaws, nearly wrenched it from my grasp. We were obliged, at length, to kill him to prevent his escape.

These little incidents show the timidity or cowardice of the alligator. He never attacks man when his intended victim is on his guard: but he is cunning enough to know when he may do this with impunity: of this we had proof at Caiçara, a few days afterwards. The river had sunk to a very low point, so that the port and bathing-place of the village now lay at the foot of a long sloping bank, and a large cayman made his

appearance in the shallow and muddy water. We were all obliged to be very careful in taking our bath ; most of the people simply using a calabash, pouring the water over themselves whilst standing on the brink. A large trading canoe, belonging to a Barra merchant named Soares, arrived at this time, and the Indian crew, as usual, spent the first day or two after their coming in port, in drunkenness and debauchery ashore. One of the men, during the greatest heat of the day when almost every one was enjoying his afternoon's nap, took it into his head whilst in a tipsy state to go down alone to bathe. He was seen only by the Juiz de Paz, a feeble old man who was lying in his hammock, in the open verandah at the rear of his house on the top of the bank, and who shouted to the besotted Indian to beware of the alligator. Before he could repeat his warning, the man stumbled, and a pair of gaping jaws, appearing suddenly above the surface, seized him round the waist and drew him under the water. A cry of agony "Ai Jesús!" was the last sign made by the wretched victim. The village was aroused : the young men with praiseworthy readiness seized their harpoons and hurried down to the bank ; but of course it was too late, a winding track of blood on the surface of the water, was all that could be seen. They embarked, however, in montarias, determined on vengeance : the monster was traced, and when, after a short lapse of time, he came up to breathe—one leg of the man sticking out from his jaws—was dispatched with bitter curses.

The last of these minor excursions which I shall

narrate, was made (again in company of Senhor Cardozo, with the addition of his housekeeper Senhora Felippa), in the season when all the population of the villages turns out to dig up turtle eggs, and revel on the praias. Placards were posted on the church doors at Ega, announcing that the excavation on Shimuní would commence on the 17th of October, and on Catuá, sixty miles below Shimuní, on the 25th. We set out on the 16th, and passed on the road, in our well-manned igarité, a large number of people, men, women, and children in canoes of all sizes, wending their way as if to a great holiday gathering. By the morning of the 17th, some 400 persons were assembled on the borders of the sandbank; each family having erected a rude temporary shed of poles and palm leaves to protect themselves from the sun and rain. Large copper kettles to prepare the oil, and hundreds of red earthenware jars, were scattered about on the sand.

The excavation of the taboleiro, collecting the eggs and purifying the oil, occupied four days. All was done on a system established by the old Portuguese governors, probably more than a century ago. The commandante first took down the names of all the masters of households, with the number of persons each intended to employ in digging; he then exacted a payment of 140 reis (about fourpence) a head, towards defraying the expense of sentinels. The whole were then allowed to go to the taboleiro. They ranged themselves round the circle, each person armed with a paddle, to be used as a spade, and then all began simultaneously to dig on a signal being given—the roll of drums—by order of the

commandante. It was an animating sight to behold the wide circle of rival diggers throwing up clouds of sand in their energetic labours, and working gradually towards the centre of the ring. A little rest was taken during the great heat of mid-day, and in the evening the eggs were carried to the huts in baskets. By the end of the second day, the taboleiro was exhausted: large mounds of eggs, some of them four to five feet in height, were then seen by the side of each hut, the produce of the labours of the family.

In the hurry of digging some of the deeper nests are passed over; to find these out the people go about provided with a long steel or wooden probe, the presence of the eggs being discoverable by the ease with which the spit enters the sand. When no more eggs are to be found, the mashing process begins. The egg, it may be here mentioned, has a flexible or leathery shell; it is quite round, and somewhat larger than a hen's egg. The whole heap is thrown into an empty canoe and mashed with wooden prongs; but sometimes naked Indians and children jump into the mass and tread it down, besmearing themselves with yolk and making about as filthy a scene as can well be imagined. This being finished, water is poured into the canoe, and the fatty mess then left for a few hours to be heated by the sun, on which the oil separates and rises to the surface. The floating oil is afterwards skimmed off with long spoons, made by tying large mussel-shells to the end of rods, and purified over the fire in copper kettles.

The destruction of turtle eggs every year by these

proceedings is enormous. At least 6000 jars, holding each three gallons of the oil, are exported annually from the Upper Amazons and the Madeira to Pará, where it is used for lighting, frying fish, and other purposes. It may be fairly estimated that 2000 more jars-full are consumed by the inhabitants of the villages on the river. Now, it takes at least twelve basketsfull of eggs, or about 6000, by the wasteful process followed, to make one jar of oil. The total number of eggs annually destroyed amounts, therefore, to 48,000,000. As each turtle lays about 120, it follows that the yearly offspring of 400,000 turtles is thus annihilated. A vast number, nevertheless, remain undetected; and these would probably be sufficient to keep the turtle population of these rivers up to the mark, if the people did not follow the wasteful practice of lying in wait for the newly-hatched young, and collecting them by thousands for eating; their tender flesh and the remains of yolk in their entrails being considered a great delicacy. The chief natural enemies of the turtle are vultures and alligators, which devour the newly-hatched young as they descend in shoals to the water. These must have destroyed an immensely greater number before the European settlers began to appropriate the eggs than they do now. It is almost doubtful if this natural persecution did not act as effectively in checking the increase of the turtle as the artificial destruction now does. If we are to believe the tradition of the Indians, however, it had not this result; for they say that formerly the waters teemed as thickly with turtles as the air now does with mosquitoes. The universal opinion of the settlers on the Upper

Amazons is, that the turtle has very greatly decreased in numbers, and is still annually decreasing.

We left Shimuní on the 20th with quite a flotilla of canoes, and descended the river to Catuá, an eleven hours' journey by paddle and current. Catuá is about six miles long, and almost entirely encircled by its praia. The turtles had selected for their egg-laying a part of the sandbank which was elevated at least twenty feet above the present level of the river; the animals, to reach the place, must have crawled up a slope. As we approached the island, numbers of the animals were seen coming to the surface to breathe, in a small shoaly bay. Those who had light montarias sped forward with bows and arrows to shoot them. Carepíra was foremost: having borrowed a small and very unsteady boat of Cardozo, and embarked in it with his little son. After bagging a couple of turtles, and whilst hauling in a third, he overbalanced himself: the canoe went over, and he with his child had to swim for their lives, in the midst of numerous alligators, about a mile from the land. The old man had to sustain a heavy fire of jokes from his companions for several days after this mishap. Such accidents are only laughed at by this almost amphibious people.

The number of persons congregated on Catuá was much greater than on Shimuní, as the population of the banks of several neighbouring lakes was here added. The line of huts and sheds extended half a mile, and several large sailing vessels were anchored at the place. The commandant was Senhor Macedo, the Indian black-

smith of Ega before mentioned, who maintained excellent order during the fourteen days the process of excavation and oil manufacture lasted. There were also many primitive Indians here from the neighbouring rivers, amongst them a family of Shumánas, good-tempered, harmless people from the Lower Japurá. All of them were tattooed round the mouth, the blueish tint forming a border to the lips, and extending in a line on the cheeks towards the ear on each side. They were not quite so slender in figure as the Passés of Pedro-uassú's family; but their features deviated quite as much as those of the Passés from the ordinary Indian type. This was seen chiefly in the comparatively small mouth, pointed chin, thin lips, and narrow, high nose. One of the daughters, a young girl of about seventeen years of age, was a real beauty. The colour of her skin approached the light tanned shade of the Mameluco women; her figure was almost faultless, and the blue mouth, instead of being a disfigurement, gave quite a captivating finish to her appearance. Her neck, wrists, and ankles were adorned with strings of blue beads. She was, however, extremely bashful, never venturing to look strangers in the face, and never quitting, for many minutes together, the side of her father and mother. The family had been shamefully swindled by some rascally trader on another praia; and, on our arrival, came to lay their case before Senhor Cardozo, as the delegado of police of the district. The mild way in which the old man, without a trace of anger, stated his complaint in imperfect Tupí, quite enlisted our sympathies in his favour. But Cardozo

could give him no redress; he invited the family, however, to make their rancho near to ours, and in the end gave them the highest price for the surplus oil which they manufactured.

It was not all work at Catuá; indeed there was rather more play than work going on. The people make a kind of holiday of these occasions. Every fine night parties of the younger people assembled on the sands, and dancing and games were carried on for hours together. But the requisite liveliness for these sports was never got up without a good deal of preliminary rum-drinking. The girls were so coy that the young men could not get sufficient partners for the dances, without first subscribing for a few flagons of the needful cashaça. The coldness of the shy Indian and Mameluco maidens never failed to give way after a little of this strong drink, but it was astonishing what an immense deal they could take of it in the course of an evening. Coyness is not always a sign of innocence in these people, for most of the half-caste women on the Upper Amazons lead a little career of looseness before they marry and settle down for life; and it is rather remarkable that the men do not seem to object much to their brides having had a child or two by various fathers before marriage. The women do not lose reputation unless they become utterly depraved, but in that case they are condemned pretty strongly by public opinion. Depravity is, however, rare, for all require more or less to be wooed before they are won. I did not see (although I mixed pretty freely with the young people) any breach of propriety on the praias. The merry-

makings were carried on near the ranchos, where the more staid citizens of Ega, husbands with their wives and young daughters, all smoking gravely out of long pipes, sat in their hammocks and enjoyed the fun. Towards midnight we often heard, in the intervals between jokes and laughter, the hoarse roar of jaguars prowling about the jungle in the middle of the praia. There were several guitar-players amongst the young men, and one most persevering fiddler, so there was no lack of music.

The favourite sport was the Pira-purasséya, or fish-dance, one of the original games of the Indians, though now probably a little modified. The young men and women, mingling together, formed a ring, leaving one of their number in the middle, who represented the fish. They then all marched round, Indian file, the musicians mixed up with the rest, singing a monotonous but rather pretty chorus, the words of which were invented (under a certain form) by one of the party who acted as leader. This finished, all joined hands, and questions were put to the one in the middle, asking what kind of fish he or she might be. To these the individual has to reply. The end of it all is that he makes a rush at the ring, and if he succeeds in escaping, the person who allowed him to do so has to take his place ; the march and chorus then recommence, and so the game goes on hour after hour. Tupí was the language mostly used, but sometimes Portuguese was sung and spoken. The details of the dance were often varied. Instead of the names of fishes being called over by the person in the middle, the name of some animal, flower, or other object

was given to every fresh occupier of the place. There was then good scope for wit in the invention of nicknames, and peals of laughter would often salute some particularly good hit. Thus a very lanky young man was called the Magoary, or the gray stork ; a moist gray-eyed man with a profile comically suggestive of a fish was christened Jarakí (a kind of fish), which was considered quite a witty sally ; a little Mameluco girl, with light-coloured eyes and brown hair, got the gallant name of Rosa branca, or the white rose ; a young fellow who had recently singed his eyebrows by the explosion of fireworks was dubbed Pedro queimado (burnt Peter) ; in short every one got a nickname, and each time the cognomen was introduced into the chorus as the circle marched round.

It is said by the Portuguese and Brazilian townspeople lower down the river, that much disorder and all kinds of immorality prevail amongst these assemblages of Upper Amazons rustics on the turtle praias. I can only say that nothing of the kind was seen on the occasions when I attended. But it may be added that there were no traders from the "civilised" parts present to set a bad example. Town-bred Indians and half-castes will be disorderly and quarrelsome, like uneducated people everywhere, when they can get their fill of intoxicating drinks. When low Portuguese traders, who are most certainly the inferiors of these rustics whom they despise, attend the praias, they corrupt the women, and bribe the Indians with cashaça to steal their masters' oil ; these proceedings, of course, give rise to disturbances in many ways. There were none of these

shining examples of the superior civilisation of Europe in attendance at Catuá. The masters kept their Indians well under control; the young people enjoyed themselves upon the whole innocently, and sociability was pretty general amongst all classes and colours.

Our rancho was a large one, and was erected in a line with the others, near the edge of the sandbank which sloped rather abruptly to the water. During the first week the people were all, more or less, troubled by alligators. Some half-dozen full-grown ones were in attendance off the praia, floating about on the lazily-flowing, muddy water. The dryness of the weather had increased since we had left Shimuní, the currents had slackened, and the heat in the middle part of the day was almost insupportable. But no one could descend to bathe without being advanced upon by one or other of these hungry monsters. There was much offal cast into the river, and this, of course, attracted them to the place. One day I amused myself by taking a basketful of fragments of meat beyond the line of ranchos, and drawing the alligators towards me by feeding them. They behaved pretty much as dogs do when fed; catching the bones I threw them in their huge jaws, and coming nearer and showing increased eagerness after every morsel. The enormous gape of their mouths, with their blood-red lining and long fringes of teeth, and the uncouth shapes of their bodies, made a picture of unsurpassable ugliness. I once or twice fired a heavy charge of shot at them, aiming at the vulnerable part of their bodies, which is a small space situated behind the eyes, but this had no other effect than to make them

NIGHT ADVENTURE WITH ALLIGATOR.

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give a hoarse grunt and shake themselves; they immediately afterwards turned to receive another bone which I threw to them.

Every day these visitors became bolder; at length they reached a pitch of impudence that was quite intolerable. Cardozo had a poodle dog named Carlito, which some grateful traveller whom he had befriended had sent him from Rio Janeiro. He took great pride in this dog, keeping it well sheared, and preserving his coat as white as soap and water could make it. We slept in our rancho in hammocks slung between the outer posts; a large wood fire (fed with a kind of wood abundant on the banks of the river, which keeps alight all night) being made in the middle, by the side of which slept Carlito on a little mat. Well, one night I was awoke by a great uproar. It was caused by Cardozo hurling burning firewood with loud curses at a huge cayman which had crawled up the bank and passed beneath my hammock (being nearest the water) towards the place where Carlito lay. The dog had raised the alarm in time; the reptile backed out and tumbled down the bank to the water, the sparks from the brands hurled at him flying from his bony hide. To our great surprise the animal (we supposed it to be the same individual) repeated his visit the very next night, this time passing round to the other side of our shed. Cardozo was awake, and threw a harpoon at him, but without doing him any harm. After this it was thought necessary to make an effort to chèck the alligators; a number of men were therefore persuaded to sally forth in their montarias and devote a day to killing them.

The young men made several hunting excursions during the fourteen days of our stay on Catuá, and I, being associated with them in all their pleasures, made generally one of the party. These were, besides, the sole occasions on which I could add to my collections, whilst on these barren sands. Only two of these trips afforded incidents worth relating.

The first, which was made to the interior of the wooded island of Catuá, was not a very successful one. We were twelve in number, all armed with guns and long hunting-knives. Long before sunrise, my friends woke me up from my hammock, where I lay, as usual, in the clothes worn during the day; and after taking each a cup-full of cashaça and ginger (a very general practice in early morning on the sandbanks), we commenced our walk. The waning moon still lingered in the clear sky, and a profound stillness pervaded sleeping camp, forest, and stream. Along the line of ranchos glimmered the fires made by each party to dry turtle-eggs for food, the eggs being spread on little wooden stages over the smoke. The distance to the forest from our place of starting was about two miles, being nearly the whole length of the sandbank, which was also a very broad one; the highest part, where it was covered with a thicket of dwarf willows, mimosas, and arrow grass, lying near the ranchos. We loitered much on the way, and the day dawned whilst we were yet on the road: the sand at this early hour feeling quite cold to the naked feet. As soon as we were able to distinguish things, the surface of the praia was seen to be dotted with small black objects. These were newly-hatched

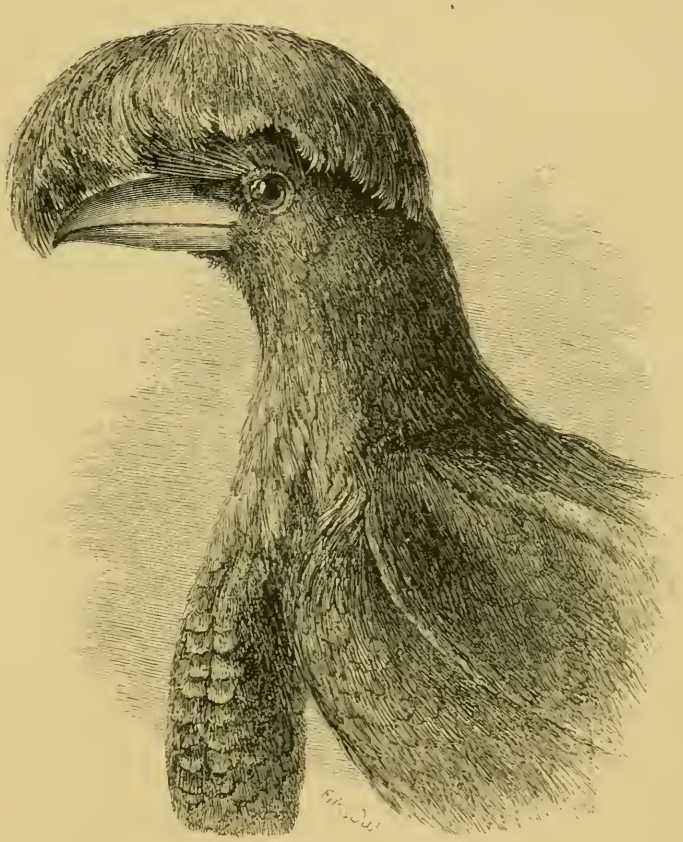
Aiyussá turtles, which were making their way in an undeviating line to the water, at least a mile distant. The young animal of this species is distinguishable from that of the large turtle and the Tracajá, by the edges of the breast-plate being raised on each side, so that in crawling it scores two parallel lines on the sand. The mouths of these little creatures were full of sand, a circumstance arising from their having to bite their way through many inches of superincumbent sand to reach the surface on emerging from the buried eggs. It was amusing to observe how constantly they turned again in the direction of the distant river, after being handled and set down on the sand with their heads facing the opposite quarter. We saw also several skeletons of the large cayman (some with the horny and bony hide of the animal nearly perfect) embedded in the sand : they reminded me of the remains of Ichthyosauri fossilized in beds of lias, with the difference of being buried in fine sand instead of in blue mud. I marked the place of one which had a well-preserved skull, and the next day returned to secure it. The specimen is now in the British Museum collection. There were also many foot-marks of Jaguars on the sand.

We entered the forest, as the sun peeped over the tree-tops far away down river. The party soon after divided ; I keeping with a section which was led by Bento, the Ega carpenter, a capital woodsman. After a short walk we struck the banks of a beautiful little lake, having grassy margins and clear dark water, on the surface of which floated thick beds of water-lilies. We then crossed a muddy creek or watercourse that entered

the lake, and then found ourselves on a *restinga*, or tongue of land between two waters. By keeping in sight of one or the other of these there was no danger of our losing our way: all other precautions were therefore unnecessary. The forest was tolerably clear of underwood, and consequently easy to walk through. We had not gone far before a soft, long-drawn whistle was heard aloft in the trees, betraying the presence of Mutums (Curassow birds). The crowns of the trees, a hundred feet or more over our heads, were so closely interwoven, that it was difficult to distinguish the birds: the practised eye of Bento, however, made them out, and a fine male was shot from the flock; the rest flying away and alighting at no great distance: the species was the one of which the male has a round red ball on its beak (Crax globicera). The pursuit of the others led us a great distance, straight towards the interior of the island, in which direction we marched for three hours, having the lake always on our right.

Arriving at length at the head of the lake, Bento struck off to the left across the restinga, and we then soon came upon a treeless space choked up with tall grass, which appeared to be the dried-up bed of another lake. Our leader was obliged to climb a tree to ascertain our position, and found that the clear space was part of the creek, whose mouth we had crossed lower down. The banks were clothed with low trees, nearly all of one species, a kind of araça (Psidium), and the ground was carpeted with a slender delicate grass, now in flower. A great number of crimson and vermilion-coloured butterflies (Catagramma

Peristera, male and female) were settled on the smooth, white trunks of these trees. I had also here the great pleasure of seeing for the first time, the rare and curious



Umbrella Bird.

Umbrella Bird (Cephalopterus ornatus), a species which resembles in size, colour, and appearance our common crow, but is decorated with a crest of long, curved, hairy feathers having long bare quills, which, when raised, spread themselves out in the form of a fringed sun-shade over the head. A strange ornament, like a pelerine, is also suspended from the neck, formed by

a thick pad of glossy steel-blue feathers, which grow on a long fleshy lobe or excrescence. This lobe is connected (as I found on skinning specimens) with an unusual development of the trachea and vocal organs, to which the bird doubtless owes its singularly deep, loud, and long-sustained fluty note. The Indian name of this strange creature is Uirá-mimbéu, or fife-bird,* in allusion to the tone of its voice. We had the good luck, after remaining quiet a short time, to hear its performance. It drew itself up on its perch, spread widely the umbrella-formed crest, dilated and waved its glossy breast-lappet, and then, in giving vent to its loud piping note, bowed its head slowly forwards. We obtained a pair, male and female: the female has only the rudiments of the crest and lappet, and is duller-coloured altogether than the male. The range of this bird appears to be quite confined to the plains of the Upper Amazons (especially the Ygapó forests), not having been found to the east of the Rio Negro.

Bento and our other friends being disappointed in finding no more Curassows, or indeed any other species of game, now resolved to turn back. On reaching the edge of the forest we sat down and ate our dinners under the shade; each man having brought a little bag containing a few handsfull of farinha, and a piece of fried fish or roast turtle. We expected our companions of the other division to join us at mid-day, but after waiting till past one o'clock without seeing anything of them (in fact, they had returned to the huts an hour or two

* Mimbéu is the Indian name for a rude kind of pan-pipes used by the Caishánas and other tribes.

previously), we struck off across the praia towards the encampment. An obstacle here presented itself on which we had not counted. The sun had shone all day through a cloudless sky untempered by a breath of wind, and the sands had become heated by it to a degree that rendered walking over them with our bare feet impossible. The most hardened footsoles of the party could not endure the burning soil. We made several attempts ; we tried running : wrapped the cool leaves of Heliconiæ round our feet, but in no way could we step forward many yards. There was no means of getting back to our friends before night, except going round the praia, a circuit of about four miles, and walking through the water or on the moist sand. To get to the water-side from the place where we then stood was not difficult, as a thick bed of a flowering shrub, called tintarána, an infusion of the leaves of which is used to dye black, lay on that side of the sand-bank. Footsore and wearied, burthened with our guns, and walking for miles through the tepid shallow water under the brain-scorching vertical sun, we had, as may be imagined, anything but a pleasant time of it. I did not, however, feel any inconvenience afterwards. Every one enjoys the most lusty health whilst living this free and wild life on the rivers.

The other hunting trip which I have alluded to was undertaken in company with three friendly young half-castes. Two of them were brothers, namely, Joaõ (John) and Zephyrino Jabutí : Jabutí, or tortoise, being a nick-name which their father had earned for his slow gait, and which, as is usual in this country, had descended

as the surname of the family. The other was José Frazaõ, a nephew of Senhor Chrysostomo, of Ega, an active, clever, and manly young fellow whom I much esteemed. He was almost a white, his father being a Portuguese and his mother a Mameluco. We were accompanied by an Indian named Lino, and a Mulatto boy, whose office was to carry our game.

Our proposed hunting-ground on this occasion lay across the water, about fifteen miles distant. We set out in a small montaria, at four o'clock in the morning, again leaving the encampment asleep, and travelled at a good pace up the northern channel of the Solimoens, or that lying between the island Catuá and the left bank of the river. The northern shore of the island had a broad sandy beach reaching to its western extremity. We reached our destination a little after daybreak ; this was the banks of the Carapanatúba,* a channel some 150 yards in width, which, like the Ananá already mentioned, communicates with the Cupiyó. To reach this we had to cross the river, here nearly two miles wide. Just as day dawned we saw a Cayman seize a large fish, a Tambakí, near the surface ; the reptile seemed to have a difficulty in securing its prey, for it reared itself above the water, tossing the fish in its jaws and making a tremendous commotion. I was much struck also by the singular appearance presented by certain diving birds having very long and snaky necks (the Plotus Anhinga). Occasionally a long serpentine form would suddenly wriggle itself to a height of a

* Meaning in Tupí, the river of many mosquitoes : from carapaná, mosquito, and itúba, many.

foot and a half above the glassy surface of the water, producing such a deceptive imitation of a snake that at first I had some difficulty in believing it to be the neck of a bird; it did not remain long in view, but soon plunged again beneath the stream.

We ran ashore in a most lonely and gloomy place, on a low sandbank covered with bushes, secured the montaria to a tree, and then, after making a very sparing breakfast on fried fish and mandioca meal, rolled up our trousers and plunged into the thick forest, which here, as everywhere else, rose like a lofty wall of foliage from the narrow strip of beach. We made straight for the heart of the land, John Jabutí leading, and breaking off at every few steps a branch of the lower trees, so that we might recognise the path on our return. The district was quite new to all my companions, and being on a coast almost totally uninhabited by human beings for some 300 miles, to lose our way would have been to perish helplessly. I did not think at the time of the risk we ran of having our canoe stolen by passing Indians; unguarded montarias being never safe even in the ports of the villages, Indians apparently considering them common property, and stealing them without any compunction. No misgivings clouded the lightness of heart with which we trod forwards in warm anticipation of a good day's sport.

The tract of forest through which we passed was Ygapó, but the higher parts of the land formed areas which went only a very few inches under water in the flood season. It consisted of a most bewildering diversity of grand and beautiful trees, draped, festooned, corded,

matted, and ribboned with climbing plants, woody and succulent, in endless variety. The most prevalent palm was the tall Astryocaryum Jauarí, whose fallen spines made it necessary to pick our way carefully over the ground, as we were all barefoot. There was not much green underwood, except in places where Bamboos grew; these formed impenetrable thickets of plumy foliage and thorny, jointed stems, which always compelled us to make a circuit to avoid them. The earth elsewhere was encumbered with rotting fruits, gigantic bean-pods, leaves, limbs, and trunks of trees, fixing the impression of its being the cemetery as well as the birthplace of the great world of vegetation overhead. Some of the trees were of prodigious height. We passed many specimens of the Moratinga, whose cylindrical trunks, I dare not say how many feet in circumference, towered up and were lost amidst the crowns of the lower trees, their lower branches, in some cases, being hidden from our view. Another very large and remarkable tree was the Assacú (Sapium aucuparium). A traveller on the Amazons, mingling with the people, is sure to hear much of the poisonous qualities of the juices of this tree. Its bark exudes, when hacked with a knife, a milky sap, which is not only a fatal poison when taken internally, but is said to cause incurable sores if simply sprinkled on the skin. My companions always gave the Assacú a wide berth when we passed one. The tree looks ugly enough to merit a bad name, for the bark is of a dingy olive colour, and is studded with short and sharp, venomous-looking spines.

After walking about half a mile we came upon a dry

water-course, where we observed, first, the old footmarks of a tapir, and, soon after, on the margins of a curious circular hole full of muddy water, the fresh tracks of a Jaguar. This latter discovery was hardly made, when a rush was heard amidst the bushes on the top of a sloping bank on the opposite side of the dried creek. We bounded forward; it was, however, too late, for the animal had sped in a few moments far out of our reach. It was clear we had disturbed, on our approach, the Jaguar, whilst quenching his thirst at the water-hole. A few steps further on we saw the mangled remains of an alligator (the Jacarétinga). The head, fore-quarters, and bony shell were the only parts which remained; but the meat was quite fresh, and there were many footmarks of the Jaguar around the carcase; so that there was no doubt this had formed the solid part of the animal's breakfast. My companions now began to search for the alligator's nest, the presence of the reptile so far from the river being accountable for on no other ground than its maternal solicitude for its eggs. We found, in fact, the nest at the distance of a few yards from the place. It was a conical pile of dead leaves, in the middle of which twenty eggs were buried. These were of elliptical shape, considerably larger than those of a duck, and having a hard shell of the texture of porcelain, but very rough on the outside. They make a loud sound when rubbed together, and it is said that it is easy to find a mother alligator in the Ygapó forests, by rubbing together two eggs in this way, she being never far off, and attracted by the sounds.

I put half-a-dozen of the alligator's eggs in my game-

bag for specimens, and we then continued on our way. Lino, who was now first, presently made a start backwards, calling out "Jararáca!" This is the name of a poisonous snake (genus Craspedocephalus), which is far more dreaded by the natives than Jaguar or Alligator. The individual seen by Lino lay coiled up at the foot of a tree, and was scarcely distinguishable, on account of the colours of its body being assimilated to those of the fallen leaves. Its hideous, flat triangular head, connected with the body by a thin neck, was reared and turned towards us: Frazaõ killed it with a charge of shot, shattering it completely, and destroying, to my regret, its value as a specimen. In conversing on the subject of Jararácas as we walked onwards, every one of the party was ready to swear that this snake attacks man without provocation, leaping towards him from a considerable distance when he approaches. I met, in the course of my daily rambles in the woods, many Jararácas, and once or twice very narrowly escaped treading on them, but never saw them attempt to spring. On some subjects the testimony of the natives of a wild country is utterly worthless. The bite of the Jararácas is generally fatal. I knew of four or five instances of death from it, and only of one clear case of recovery after being bitten; but in that case the person was lamed for life.

We walked over moderately elevated and dry ground for about a mile, and then descended (three or four feet only) to the dry bed of another creek. This was pierced in the same way as the former water-course, with round holes full of muddy water. They occurred at intervals

of a few yards, and had the appearance of having been made by the hand of man. The smallest were about two feet, the largest seven or eight feet in diameter. As we approached the most considerable of the larger ones, I was startled at seeing a number of large serpent-like heads bobbing above the surface. They proved to be those of electric eels, and it now occurred to me that these round holes were made by these animals working constantly round and round in the moist muddy soil. Their depth (some of them were at least eight feet deep) was doubtless due also to the movements of the eels in the soft soil, and accounted for their not drying up, in the fine season, with the rest of the creek. Thus, whilst alligators and turtles in this great inundated forest region retire to the larger pools during the dry season, the electric eels make for themselves little ponds in which to pass the season of drought.

My companions now cut each a stout pole, and proceeded to eject the eels in order to get at the other fishes, with which they had discovered the ponds to abound. I amused them all very much by showing how the electric shock from the eels could pass from one person to another. We joined hands in a line whilst I touched the biggest and freshest of the animals on the head with the point of my hunting-knife. We found that this experiment did not succeed more than three times with the same eel when out of the water: for, the fourth time, the shock was scarcely perceptible. All the fishes found in the holes (besides the eels) belonged to one species, a small kind of Acarí, or Loricaria, a group whose members have a complete bony integument. Lino and the boy

strung them together through the gills with slender sipós, and hung them on the trees to await our return later in the day.

Leaving the bed of the creek, we marched onwards, always towards the centre of the land ; guided by the sun, which now glimmered through the thick foliage overhead. About eleven o'clock we saw a break in the forest before us, and presently emerged on the banks of a considerable sheet of water. This was one of the interior pools of which there are so many in this district. The margins were elevated some few feet, and sloped down to the water, the ground being hard and dry to the water's edge, and covered with shrubby vegetation. We passed completely round this pool, finding the crowns of the trees on its borders tenanted by curassow birds, whose presence was betrayed as usual by the peculiar note which they emit. My companions shot two of them. At the farther end of the lake lay a deep watercourse, which we traced for about half a mile, and found to communicate with another and smaller pool. This second one evidently swarmed with turtles, as we saw the snouts of many peering above the surface of the water : the same had not been seen in the larger lake, probably because we had made too much noise in hailing our discovery, on approaching its banks. My friends made an arrangement on the spot for returning to this pool, after the termination of the egg harvest on Catuá.

In recrossing the space between the two pools, we heard the crash of monkeys in the crowns of trees overhead. The chace of these occupied us a considerable time. José fired at length at one of the laggards of the

troop, and wounded him. He climbed pretty nimbly towards a denser part of the tree, and a second and third discharge failed to bring him down. The poor maimed creature then trailed his limbs to one of the topmost branches, where we descried him soon after, seated and picking the entrails from a wound in his abdomen; a most heart-rending sight. The height from the ground to the bough on which he was perched could not have been less than 150 feet, and we could get a glimpse of him only by standing directly underneath, and straining our eyes upwards. We killed him at last by loading our best gun with a careful charge, and resting the barrel against the tree-trunk to steady the aim. A few shots entered his chin, and he then fell heels over head screaming to the ground. Although it was I who gave the final shot, this animal did not fall to my lot in dividing the spoils at the end of the day. I regret now not having preserved the skin, as it belonged to a very large species of Cebus, and one which I never met with afterwards.

It was about one o'clock in the afternoon when we again reached the spot where we had first struck the banks of the larger pool. We had hitherto had but poor sport, so after dining on the remains of our fried fish and farinha, and smoking our cigarettes, the apparatus for making which, including bamboo tinder-box and steel and flint for striking a light, being carried by every one always on these expeditions, we made off in another (westerly) direction through the forest to try to find better hunting-ground. We quenched our thirst with water from the pool, which I was rather surprised

to find quite pure. These pools are, of course, sometimes fouled for a time by the movements of alligators and other tenants in the fine mud which settles at the bottom, but I never observed a scum of confervæ or traces of oil revealing animal decomposition on the surface of these waters, nor was there ever any foul smell perceptible. The whole of this level land, instead of being covered with unwholesome swamps emitting malaria, forms in the dry season (and in the wet also) a most healthy country. How elaborate must be the natural processes of self-purification in these teeming waters!

On our fresh route we were obliged to cut our way through a long belt of bamboo underwood, and not being so careful of my steps as my companions, I trod repeatedly on the flinty thorns which had fallen from the bushes, finishing by becoming completely lame, one thorn having entered deeply into the sole of my foot. I was obliged to be left behind; Lino, the Indian, remaining with me. The careful fellow cleaned my wounds with his saliva, placed pieces of isca (the felt-like substance manufactured by ants) on them to staunch the blood, and bound my feet with tough bast to serve as shoes, which he cut from the bark of a Mongúba tree. He went about his work in a very gentle way and with much skill, but was so sparing of speech that I could scarcely get answers to the questions I put to him. When he had done, I was able to limp about pretty nimbly. An Indian when he performs a service of this kind never thinks of a reward. I did not find so much disinterestedness in negro slaves or half-castes.

We had to wait two hours for the return of our companions; during part of this time I was left quite alone, Lino having started off into the jungle after a peccary (a kind of wild hog) which had come near to where we sat, but on seeing us had given a grunt and bounded off into the thickets. At length our friends hove in sight, loaded with game; having shot twelve curassows and two cujubíms (Penelope Pipile), a handsome black fowl with a white head, which is arboreal in its habits like the rest of this group of Gallinaceous birds inhabiting the South American forests. They had discovered a third pool containing plenty of turtles. Lino rejoined us at the same time, having missed the peccary, but in compensation shot a Quandú, or porcupine. The mulatto boy had caught alive in the pool a most charming little water-fowl, a species of grebe. It was somewhat smaller than a pigeon, and had a pointed beak; its feet were furnished with many intricate folds or frills of skin instead of webs, and resembled very much those of the gecko lizards. The bird was kept as a pet in Jabutí's house at Ega for a long time afterwards, where it became accustomed to swim about in a common hand-basin full of water, and was a great favourite with everybody.

We now retraced our steps towards the water-side, a weary walk of five or six miles, reaching our canoe by half-past five o'clock, or a little before sunset. It was considered by every one at Catuá that we had had an unusually good day's sport. I never knew any small party to take so much game in one day in these forests, over which animals are everywhere so widely

and sparingly scattered. My companions were greatly elated, and on approaching the encampment at Catuá made a great commotion with their paddles to announce their successful return, singing in their loudest key one of the wild choruses of the Amazonian boatmen.

The excavation of eggs and preparation of the oil being finished, we left Catuá on the 3rd of November. Carepíra, who was now attached to Cardozo's party, had discovered another lake rich in turtles, about twelve miles distant, in one of his fishing rambles, and my friend resolved, before returning to Ega, to go there with his nets and drag it as we had formerly done the Aningal. Several mameluco families of Ega begged to accompany us to share the labours and booty; the Shumána family also joined the party; we therefore formed a large body, numbering in all eight canoes and fifty persons.

The summer season was now breaking up; the river was rising; the sky was almost constantly clouded, and we had frequent rains. The mosquitoes also, which we had not felt whilst encamped on the sand-banks, now became troublesome. We paddled up the north-westerly channel, and arrived at a point near the upper end of Catuá at ten o'clock p.m. There was here a very broad beach of untrodden white sand, which extended quite into the forest, where it formed rounded hills and hollows like sand dunes, covered with a peculiar vegetation: harsh, reedy grasses, and low trees matted together with lianas, and varied with dwarf spiny palms of the genus Bactris. We encamped for the night on the sands, finding the

place luckily free from mosquitoes. The different portions of the party made arched coverings with the toldos or maranta-leaf awnings of their canoes to sleep under, fixing the edges in the sand. No one, however, seemed inclined to go to sleep, so after supper we all sat or lay around the large fires and amused ourselves. We had the fiddler with us, and in the intervals between the wretched tunes which he played, the usual amusement of story-telling beguiled the time: tales of hair-breadth escapes from jaguar, alligator, and so forth. There were amongst us a father and son who had been the actors, the previous year, in an alligator adventure on the edge of the praia we had just left. The son, whilst bathing, was seized by the thigh and carried under water: a cry was raised, and the father, rushing down the bank, plunged after the rapacious beast which was diving away with his victim. It seems almost incredible that a man could overtake and master the large cayman in his own element; but such was the case in this instance, for the animal was reached and forced to release his booty by the man's thrusting his thumb into his eye. The lad showed us the marks of the alligator's teeth in his thighs. We sat up until past midnight listening to these stories and assisting the flow of talk by frequent potations of burnt rum. A large shallow dish was filled with the liquor and fired: when it had burnt for a few minutes the flame was extinguished and each one helped himself by dipping a tea-cup into the vessel.

One by one the people dropped asleep, and then the quiet murmur of talk of the few who remained awake was

interrupted by the roar of jaguars in the jungle about a furlong distant. There was not one only, but several of the animals. The older men showed considerable alarm, and proceeded to light fresh fires around the outside of our encampment. I had read in books of travel of tigers coming to warm themselves by the fires of a bivouac, and thought my strong wish to witness the same sight would have been gratified to-night. I had not, however, such good fortune, although I was the last to go to sleep, and my bed was the bare sand under a little arched covering open at both ends. The jaguars, nevertheless, must have come very near during the night, for their fresh footmarks were numerous within a score yards of the place where we slept. In the morning I had a ramble along the borders of the jungle, and found the tracks very numerous and close together on the sandy soil.

We remained in this neighbourhood four days, and succeeded in obtaining many hundred turtles, but we were obliged to sleep two nights within the Carapanatúba channel. The first night passed rather pleasantly, for the weather was fine and we encamped in the forest, making large fires and slinging our hammocks between the trees. The second was one of the most miserable nights I ever spent. The air was close, and a drizzling rain began to fall about midnight, lasting until morning. We tried at first to brave it out under the trees. Several very large fires were made, lighting up with ruddy gleams the magnificent foliage in the black shades around our encampment. The heat and smoke had the desired effect of keeping off pretty well the

mosquitoes, but the rain continued until at length everything was soaked, and we had no help for it but to bundle off to the canoes with drenched hammocks and garments. There was not nearly room enough in the flotilla to accommodate so large a number of persons lying at full length ; moreover the night was pitch dark, and it was quite impossible in the gloom and confusion to get at a change of clothing. So there we lay, huddled together in the best way we could arrange ourselves, exhausted with fatigue and irritated beyond all conception by clouds of mosquitoes. I slept on a bench with a sail over me, my wet clothes clinging to my body, and to increase my discomfort, close beside me lay an Indian girl, one of Cardozo's domestics, who had a skin disfigured with black diseased patches, and whose thick clothing, not having been washed during the whole time we had been out (eighteen days), gave forth a most vile effluvia.

We spent the night of the 7th of November pleasantly on the smooth sands, where the jaguars again serenaded us, and on the succeeding morning commenced our return voyage to Ega. We first doubled the upper end of the island of Catuá, and then struck off for the right bank of the Solimoens. The river was here of immense width, and the current was so strong in the middle that it required the most strenuous exertions on the part of our paddlers to prevent us from being carried miles away down the stream. At night we reached Juteca, a small river which enters the Solimoens by a channel so narrow that a man might almost jump across it, but a furlong inwards expands into a very pretty lake

several miles in circumference. We slept again in the forest, and again were annoyed by rain and mosquitoes: but this time Cardozo and I preferred remaining where we were to mingling with the reeking crowd in the boats. When the grey dawn arose a steady rain was still falling, and the whole sky had a settled leaden appearance, but it was delightfully cool. We took our net into the lake and gleaned a good supply of delicious fish for breakfast. I saw at the upper end of this lake the native rice of this country growing wild.

The weather cleared up at 10 o'clock a.m. At 3 p.m. we arrived at the mouth of the Cayambé, another tributary stream much larger than the Juteca. The channel of exit to the Solimoens was here also very narrow, but the expanded river inside is of vast dimensions: it forms a lake (I may safely venture to say) several score miles in circumference. Although prepared for these surprises, I was quite taken aback in this case. We had been paddling all day along a monotonous shore, with the dreary Solimoens before us, here three to four miles broad, heavily rolling onward its muddy waters. We come to a little gap in the earthy banks, and find a dark, narrow inlet with a wall of forest over-shadowing it on each side: we enter it, and at a distance of two or three hundred yards a glorious sheet of water bursts upon the view. The scenery of Cayambé is very picturesque. The land, on the two sides visible of the lake, is high and clothed with sombre woods, varied here and there with a white-washed house, in the middle of a green patch of clearing, belonging to settlers. In striking contrast to these dark, rolling forests

is the vivid, light-green and cheerful foliage of the woods on the numerous islets which rest like water-gardens on the surface of the lake. Flocks of ducks, storks, and snow-white herons inhabit these islets, and a noise of parrots with the tingling chorus of Tamburí-parás was heard from them as we passed. This has a cheering effect after the depressing stillness and absence of life in the woods on the margins of the main river.

Cardozo and I with two Indians took a small canoe and crossed the lake on a visit to Senhor Gaspar José Rodriguez, a well-to-do farmer, and the principal resident of Cayambé. His eldest daughter, a home-loving, industrious girl, had married the Portuguese Miguel, my old travelling companion, a few days before we left Ega on these rambles. We had attended and danced at the wedding, and this present visit was in fulfilment of a promise to call on the family whenever we should be near Cayambé. Senhor Gaspar was one of those numerous half-caste proprietors, a few of whom I have had occasion to mention, who by their industrious, regular habits, good sense, and fair dealing, do credit to the class to which they belong. We have heard so much in England of the worthlessness of the half-caste population of Tropical America that it is a real pleasure to be able to bear witness that they are not wholly bad. It is, however, in retired country districts where I have chiefly mixed with them. Some of them, such as the friend of whom I am speaking, are, considering their defective education, as worthy men as can be found in any country. There is however, it must be confessed, a considerable number of super-

latively lazy, tricky, and sensual characters amongst the half-castes, both in rural places and in the towns. I found the establishment of Senhor Gaspar similar to that of Joaõ Trinidade which I have before described, opposite to the mouth of the Madeira. It was situated on a high bank: the dwelling-house was large and airy, but roughly built, and with unplastered mud-walls. There was a considerable number of outhouses, and in the rear, extensive orchards of fruit and coffee trees, with paths through them leading to the mandioca plantations. Senhor Miguel, with his wife, were absent at a new clearing which they had made for themselves in another part of the banks of the lake. The rest of the family were at home.

We were received with frank hospitality by these shrewd and lively people. Senhor Gaspar had seven children, and had himself taught them all to read and write. The boys were very quick; one of them afterwards became clerk to the Municipal Chamber of Ega. There was an air of cheerfulness and abundance about the place that was quite exhilarating.

We dined, seated on a large mat, over which a clean white towel was spread: the meal consisting of fowls and rice (the general entertainment in this country for visitors), with dessert of "laranjas torradas," or toasted oranges; that is, oranges partially dried in the sun. The fruit, grown with a little greater care in Gaspar's orchard than is usually bestowed on it in this country, was very fine in itself, but treated in this form its sweetness and richness of flavour were far superior to anything I had yet tasted. When we were about leaving,

our host, having listened to my praises of the fruit, sent down to our canoe a large basketful as a present. The conversation after dinner turned on the difficulty of getting good houses built at Ega; on the backward condition of the province; the disregard of the interests of the agricultural class shown by the Government in taxing all the produce of the interior on its reaching Pará, and so forth. Senhor Gaspar had just finished the erection of a substantial town-house at Ega. He told me that it was cheaper to send down to Pará (2800 miles there and back) for doors and shutters, than to make them at Ega; for, as there were no large saws anywhere on the Solimoens, every plank had to be hewn out of the tree with a hatchet.

On our return to the mouth of the Cayambé, whilst in the middle of the lake, a squall suddenly arose, in the direction towards which we were going, and for a whole hour we were in great danger of being swamped. The wind blew away the awning and mats, and lashed the waters into foam: the waves rising to a great height. Our boat, fortunately, was excellently constructed, rising well towards the prow, so that with good steering we managed to head the billows as they arose and escaped without shipping much water. We reached our igarité at sunset, and then made all speed to Curubarú, fifteen miles distant, to encamp for the night on the sands. We reached the praia at 10 o'clock. The waters were now mounting fast upon the sloping beach, and we found on dragging the net next morning that fish was beginning to be scarce. Cardozo and his friends talked quite gloomily at breakfast time over the departure of the

joyous *veraõ*, and the setting in of the dull, hungry winter season.

At 9 o'clock in the morning of the 10th of November a light wind from down river sprang up, and all who had sails hoisted them. It was the first time during our trip that we had had occasion to use our sails: so continual is the calm on this upper river. We bowled along merrily, and soon entered the broad channel lying between Bariá and the mainland on the south bank. The wind carried us right into the mouth of the Teffé, and at 4 o'clock p.m. we cast anchor in the port of Ega.

## CHAPTER V.

### ANIMALS OF THE NEIGHBOURHOOD OF EGA.

Scarlet-faced Monkeys—Parauacú Monkey—Owl-faced Night-apes—Marmosets—Jupurá—Comparison of Monkeys of the New World with those of the Old—Bats—Birds—Cuvier's Toucan—Curl-crested Toucan—Insects—Pendulous Cocoons—Foraging Ants—Blind Ants.

As may have been gathered from the remarks already made, the neighbourhood of Ega was a fine field for a Natural History collector. With the exception of what could be learnt from the few specimens brought home, after transient visits, by Spix and Martius and the Count de Castelnau, whose acquisitions have been deposited in the public museums of Munich and Paris, very little was known in Europe of the animal tenants of this region; the collections that I had the opportunity of making and sending home attracted, therefore, considerable attention. Indeed, the name of my favourite village has become quite a household word amongst a numerous class of Naturalists, not only in England but abroad, in consequence of the very large number of new species (upwards of 3000) which they have had to describe, with the locality "Ega" attached to them. The discovery of new species, however, forms but a small item in

the interest belonging to the study of the living creation. The structure, habits, instincts, and geographical distribution of some of the oldest-known forms supply inexhaustible materials for reflection. The few remarks I have to make on the animals of Ega will relate to the mammals, birds, and insects, and will sometimes apply to the productions of the whole Upper Amazons region. We will begin with the monkeys, the most interesting, next to man, of all animals.

*Scarlet-faced Monkeys.*—Early one sunny morning, in the year 1855, I saw in the streets of Ega, a number of Indians carrying on their shoulders down to the port, to be embarked on the Upper Amazons steamer, a large cage made of strong lianas, some twelve feet in length and five in height, containing a dozen monkeys of the most grotesque appearance. Their bodies (about eighteen inches in height, exclusive of limbs) were clothed from neck to tail with very long, straight, and shining whitish hair; their heads were nearly bald, owing to the very short crop of thin gray hairs, and their faces glowed with the most vivid scarlet hue. As a finish to their striking physiognomy, they had bushy whiskers of a sandy colour, meeting under the chin, and reddish-yellow eyes. They sat gravely and silently in a group, and altogether presented a strange spectacle. These red-faced apes belonged to a species called by the Indians Uakarí, which is peculiar to the Ega district, and the cage with its contents was being sent as a present by Senhor Chrysostomo, the Director of Indians of the Japurá, to one of the Government officials at Rio Janeiro, in acknowledgment of having

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been made colonel of the new national guard. They had been obtained with great difficulty in the forests which cover the low lands, near the principal mouth of the Japurá, about thirty miles from Ega. It was the first time I had seen this most curious of all the South American monkeys, and one that appears to have escaped the notice of Spix and Martius. I afterwards made a journey to the district inhabited by it, but did not then succeed in obtaining specimens; before leaving the country, however, I acquired two individuals, one of which lived in my house for several weeks.

The scarlet-faced monkey belongs, in all essential points of structure, to the same family (Cebidæ) as the rest of the large-sized American species; but it differs from all its relatives in having only the rudiment of a tail, a member which reaches in some allied kinds the highest grade of development known in the order. It was so unusual to see a nearly tailless monkey from America, that naturalists thought, when the first specimens arrived in Europe, that the member had been shortened artificially. Nevertheless, the Uakarí is not quite isolated from its related species of the same family, several other kinds, also found on the Amazons, forming a graduated passage between the extreme forms as regards the tail. The appendage reaches its perfection in those genera (the Howlers, the Lagothrix and the Spider monkeys) in which it presents on its under-surface near the tip a naked palm, which makes it sensitive and useful as a fifth hand in climbing. In the rest of the genera of Cebidæ (seven in number, containing thirty-eight species), the tail is weaker in structure, entirely

covered with hair, and of little or no service in climbing, a few species nearly related to our Uakarí having it much shorter than usual. All the Cebidæ, both long-tailed and short-tailed, are equally dwellers in trees. The scarlet-faced monkey lives in forests, which are inundated during great part of the year, and is never known to descend to the ground ; the shortness of its tail is therefore no sign of terrestrial habits, as it is in the Macaques and Baboons of the Old World. It differs a little from the typical Cebidæ in its teeth, the incisors being oblique and, in the upper jaw, converging, so as to leave a gap between the outermost and the canine teeth. Like all the rest of its family, it differs from the monkeys of the old world, and from man, in having an additional grinding-tooth (premolar) in each side of both jaws, making the complete set thirty-six instead of thirty-two in number.

The white Uakarí (Brachyurus calvus), seems to be found in no other part of America than the district just mentioned, namely, the banks of the Japurá, near its principal mouth ; and even there it is confined, as far as I could learn, to the western side of the river. It lives in small troops amongst the crowns of the lofty trees, living on fruits of various kinds. Hunters say it is pretty nimble in its motions, but is not much given to leaping, preferring to run up and down the larger boughs in travelling from tree to tree. The mother, as in other species of the monkey order, carries her young on her back. Individuals are obtained alive by shooting them with the blow-pipe and arrows tipped with diluted Urarí poison. They run a considerable distance after being

pierced, and it requires an experienced hunter to track them. He is considered the most expert who can keep pace with a wounded one, and catch it in his arms when it falls exhausted. A pinch of salt, the antidote to the poison, is then put in its mouth, and the creature revives. The species is rare, even in the limited district which it inhabits. Senhor Chrysostomo sent six of his most skilful Indians, who were absent three weeks before they obtained the twelve specimens which formed his unique and princely gift. When an independent hunter obtains one, a very high price (thirty to forty milreis*) is asked, these monkeys being in great demand for presents to persons of influence down the river.

Adult Uakarís, caught in the way just described, very rarely become tame. They are peevish and sulky, resisting all attempts to coax them, and biting anyone who ventures within reach. They have no particular cry, even when in their native woods; in captivity they are quite silent. In the course of a few days or weeks, if not very carefully attended to, they fall into a listless condition, refuse food and die. Many of them succumb to a disease which I supposed from the symptoms to be inflammation of the chest or lungs. The one which I kept as a pet died of this disorder after I had had it about three weeks. It lost its appetite in a very few days, although kept in an airy verandah; its coat, which was originally long, smooth, and glossy, became dingy and ragged like that of the specimens seen in museums, and the bright scarlet colour of its face changed to a duller hue. This colour, in health, is spread over

* Three pounds seven shillings to four pounds thirteen shillings.

the features up to the roots of the hair on the forehead and temples, and down to the neck, including the flabby cheeks which hang down below the jaws. The animal, in this condition, looks at a short distance as though some one had laid a thick coat of red paint on its countenance. The death of my pet was slow; during the last twenty-four hours it lay prostrate, breathing quickly, its chest strongly heaving; the colour of its face became gradually paler, but was still red when it expired. As the hue did not quite disappear until two or three hours after the animal was quite dead, I judged that it was not exclusively due to the blood, but partly to a pigment beneath the skin which would probably retain its colour a short time after the circulation had ceased.

After seeing much of the morose disposition of the Uakarí, I was not a little surprised one day at a friend's house to find an extremely lively and familiar individual of this species. It ran from an inner chamber straight towards me after I had sat down on a chair, climbed my legs and nestled in my lap, turning round and looking up with the usual monkey's grin, after it had made itself comfortable. It was a young animal which had been taken when its mother was shot with a poisoned arrow; its teeth were incomplete, and the face was pale and mottled, the glowing scarlet hue not supervening in these animals before mature age; it had also a few long black hairs on the eyebrows and lips. The frisky little fellow had been reared in the house amongst the children, and allowed to run about freely, and take its meals with the rest of the household. There are few animals which the Brazilians of these

villages have not succeeded in taming. I have even seen young jaguars running loose about a house, and treated as pets. The animals that I had, rarely became familiar, however long they might remain in my possession, a circumstance due no doubt to their being kept always tied up.

The Uakarí is one of the many species of animals which are classified by the Brazilians as "mortál," or of delicate constitution, in contradistinction to those which are "duro," or hardy. A large proportion of the specimens sent from Ega die before arriving at Pará, and scarcely one in a dozen succeeds in reaching Rio Janeiro alive. It appears, nevertheless, that an individual has once been brought in a living state to England, for Dr. Gray relates that one was exhibited in the gardens of the Zoological Society in 1849. The difficulty it has of accommodating itself to changed conditions probably has some connection with the very limited range or confined sphere of life of the species in its natural state, its native home being an area of swampy woods, not more than about sixty square miles in extent, although no permanent barrier exists to check its dispersal, except towards the south, over a much wider space. When I descended the river in 1859, we had with us a tame adult Uakarí, which was allowed to ramble about the vessel, a large schooner. When we reached the mouth of the Rio Negro, we had to wait four days whilst the custom-house officials at Barra, ten miles distant, made out the passports for our crew, and during this time the schooner lay close to the shore, with its bowsprit secured to the trees on the bank. Well, one morning,

scarlet-face was missing, having made his escape into the forest. Two men were sent in search of him, but returned after several hours' absence, without having caught sight of the runaway. We gave up the monkey for lost, until the following day, when he re-appeared on the skirts of the forest, and marched quietly down the bowsprit to his usual place on deck. He had evidently found the forests of the Rio Negro very different from those of the delta lands of the Japurá, and preferred captivity to freedom in a place that was so uncongenial to him.

A most curious fact connected with this monkey is the existence of an allied form, or brother species, in a tract of country lying to the west of its district. This differs in being clothed with red instead of white hair, and has been described by Isidore Geoffroy St. Hilaire (from specimens brought to Paris in 1847 by the Comte de Castlenau) as a distinct species, under the name of Brachyurus rubicundus. It wholly replaces the white form in the western parts of the Japurá delta: that is to say, in a uniform district of country, 150 miles in length, and sixty to eighty in breadth, the eastern half is tenanted exclusively by white Uakarís, and the western half by red ones. The district, it may be mentioned, is crossed by several channels, which at the present time doubtless serve as barriers to the dispersal of monkeys, but cannot have done so for many centuries, as the position of low alluvial lands, and the direction of channels in the Amazons Valley, change considerably in the course of a few years. The red-haired Uakarí appears to be most frequently found in the

forests lying opposite to the mouth of the river which leads to Fonteboa, and ranges thence to the banks of the Uatí-paraná, the most westerly channel of the Japurá, situated near Tunantins. Beyond that point to the west there is no trace of either the red or the white form, nor of any other allied species. Neither do they pass to the eastward of the main mouth of the Japurá, or to the south shore of the Solimoens. How far they range northwards along the banks of the Japurá, I could not precisely ascertain; Senhor Chrysostomo, however, assured me that at 180 miles from the mouth of this river, neither white nor red Uakarí is found, but that a third, black-faced and gray-haired species, takes their place. I saw two adult individuals of Brachyurus rubicundus at Ega, and a young one at Fonteboa; but was unable to obtain specimens myself, as the forests were inundated at the time I visited their locality. I was surprised to find the hair of the young animal much paler in colour than that of the adults, it being of a sandy and not of a brownish-red hue, and consequently did not differ very much from that of the white species; the two forms, therefore, are less distinct from each other in their young than in their adult states. The fact of the range of these singular monkeys being so curiously limited as here described, cannot be said to be established until the country lying between the northern shore of the Solimoens and New Granada be well explored, but there can be no doubt of the separation of the two forms in the Delta lands of the Japurá, and this is a most instructive fact in the geographical distribution of animals.

*The Parauacú Monkey.* — Another Ega monkey, nearly related to the Uakarís, is the Parauacú (Pithecia hirsuta), a timid inoffensive creature, with a long bear-like coat of harsh speckled-gray hair. The long fur hangs over the head, half concealing the pleasing, diminutive face, and clothes also the tail to the tip, which member is well developed, being eighteen inches in length, or longer than the body. The Parauacú is found on the "terra firma" lands of the north shore of the Solimoens from Tunantins to Peru. It exists also on the south side of the river, namely on the banks of the Teffé, but there under a changed form, which differs from its type in colours about as much as the red differs from the white Uakarí. This form has been described by Dr. Gray as a distinct species, under the name of Pithecia albicans. The Parauacú is also a very delicate animal, rarely living many weeks in captivity ; but anyone who succeeds in keeping it alive for a month or two, gains by it a most affectionate pet. One of the specimens of Pithecia albicans now in the British Museum was, when living, the property of a young Frenchman, a neighbour of mine at Ega. It became so tame in the course of a few weeks that it followed him about the streets like a dog. My friend was a tailor, and the little pet used to spend the greater part of the day seated on his shoulder, whilst he was at work on his board. It showed, nevertheless, great dislike to strangers, and was not on good terms with any other member of my friend's household than himself. I saw no monkey that showed so strong a personal attachment as this gentle, timid, silent little creature. The eager and passionate Cebi seem to take

the lead of all the South American monkeys in intelligence and docility, and the Coaitá has perhaps the most gentle and impressible disposition ; but the Parauacú, although a dull, cheerless animal, excels all in this quality of capability of attachment to individuals of our own species. It is not wanting, however, in intelligence as well as moral goodness, proof of which was furnished one day by an act of our little pet. My neighbour had quitted his house in the morning without taking Parauacú with him, and the little creature having missed its friend, and concluded, as it seemed, that he would be sure to come to me, both being in the habit of paying me a daily visit together, came straight to my dwelling, taking a short cut over gardens, trees, and thickets, instead of going the roundabout way of the street. It had never done this before, and we knew the route it had taken only from a neighbour having watched its movements. On arriving at my house and not finding its master, it climbed to the top of my table, and sat with an air of quiet resignation waiting for him. Shortly afterwards my friend entered, and the gladdened pet then jumped to its usual perch on his shoulder.

*Owl-faced Night Apes.*—A third interesting genus of monkeys, found near Ega, are the Nyctipitheci, or night apes, called Ei-á by the Indians. Of these I found two species, closely related to each other but nevertheless quite distinct, as both inhabit the same forests, namely, those of the higher and drier lands, without mingling with each other or intercrossing. They sleep all day long in hollow trees, and come forth to prey on insects

and eat fruits only in the night. They are of small size, the body being about a foot long, and the tail fourteen inches, and are thickly clothed with soft grey and brown fur, similar in substance to that of the rabbit. Their physiognomy reminds one of an owl, or tiger-cat: the face is round and encircled by a ruff of whitish fur; the muzzle is not at all prominent; the mouth and chin are small; the ears are very short, scarcely appearing above the hair of the head; and the eyes are large and yellowish in colour, imparting the staring expression of nocturnal animals of prey. The forehead is whitish, and decorated with three black stripes, which in one of the species (Nyctipithecus trivirgatus) continue to the crown, and in the other (N. felinus) meet on the top of the forehead. N. trivirgatus was first described by Humboldt, who discovered it on the banks of the Cassiquiare, near the head waters of the Rio Negro.

One cannot help being struck by this curious modification of the American type of monkeys, for the owl-faced night-apes have evidently sprung from the same stock as the rest of the Cebidæ, as they do not differ much in all essential points from the Whaiápu-sais (Callithrix), and the Sai-mirís (Chrysothrix). They have nails of the ordinary form to all their fingers, and semi-opposable thumbs; but the molar teeth (contrary to what is usual in the Cebidæ) are studded with sharp points, showing that their natural food is principally insects.

I kept a pet animal of the N. trivirgatus for many months, a young one having been given to me by an Indian *compadre*, as a present from my newly-baptised

godson. These monkeys, although sleeping by day, are aroused by the least noise; so that, when a person passes by a tree in which a number of them are concealed, he is startled by the sudden apparition of a group of little striped faces crowding a hole in the trunk. It was in this way that my compadre discovered the colony from which the one given to me was taken. I was obliged to keep my pet chained up; it therefore never became thoroughly familiar. I once saw, however, an individual of the other species (N. felinus) which was most amusingly tame. It was as lively and nimble as the Cebi, but not so mischievous and far more confiding in its disposition, delighting to be caressed by all persons who came into the house. But its owner, the Municipal Judge of Ega, Dr. Carlos Mariana, had treated it for many weeks with the greatest kindness, allowing it to sleep with him at night in his hammock, and to nestle in his bosom half the day as he lay reading. It was a great favourite with every one, from the cleanliness of its habits and the prettiness of its features and ways. My own pet was kept in a box, in which was placed a broad-mouthed glass jar; into this it would dive, head foremost, when any one entered the room, turning round inside, and thrusting forth its inquisitive face an instant afterwards to stare at the intruder. It was very active at night, venting at frequent intervals a hoarse cry, like the suppressed barking of a dog, and scampering about the room, to the length of its tether, after cockroaches and spiders. In climbing between the box and the wall, it straddled the space, resting its hands on the palms and tips of the outstretched fingers

with the knuckles bent at an acute angle, and thus mounted to the top with the greatest facility. Although seeming to prefer insects, it ate all kinds of fruit, but would not touch raw or cooked meat, and was very seldom thirsty. I was told by persons who had kept these monkeys loose about the house, that they cleared the chambers of bats as well as insect vermin. When approached gently, my Ei-á allowed itself to be caressed; but when handled roughly, it always took alarm, biting severely, striking out its little hands, and making a hissing noise like a cat. As already related, my pet was killed by a jealous Caiarára monkey, which was kept in the house at the same time.

I have mentioned the near relationship of the night apes to the Sai-miris (Chrysothrix), which are amongst the commonest of the ordinary monkeys of the American forests. This near relationship is the more necessary to be borne in mind, as some zoologists have drawn a comparison between the Nyctipitheci and the Microcebi, Nycticebi, and Loris, nocturnal apes of the Lemur family inhabiting Ceylon and Java, and it might be erroneously inferred that our American Ei-ás were related more closely to these Old World forms than they are to the rest of the New World monkeys. The Nycticebus of Java has also large nocturnal eyes, short ears, and a physiognomy similar to that of our Nyctipitheci; resemblances which might seem to be strong proofs of blood-relationship, but these points are fallacious guides in ascertaining the genealogy of these animals; they are simply *resemblances of analogy*, and merely show that a few species belonging to utterly dissimilar families have been made similar

by being adapted to similar modes of life. The Loris and their relatives of Tropical Asia have six incisor teeth to the lower jaws, and belong, in all other essential points of structure, to the Lemur family, which has not a single representative in the New World. The Ei-ás have teeth of the same number, and growing in nearly the same position, as their near relatives the Sai-mirís. I obtained, moreover, yet stronger proof of this close relationship between the night and day monkeys of America, in finding a species on the Upper Amazons which supplies a link between them. This one had ears nearly as short as those of the night apes, and also a striped forehead; the stripes being, however, two in number, instead of three: the colours of the body were very similar to those of the well-known Chrysothrix sciureus, and the eyes were fitted for day vision.

*Barrigudo Monkeys.*—Ten other species of monkeys were found, in addition to those already mentioned, in the forests of the Upper Amazons. All were strictly arboreal and diurnal in their habits, and lived in flocks, travelling from tree to tree, the mothers with their children on their backs; leading, in fact, a life similar to that of the Parárauáte Indians, and, like them, occasionally plundering the plantations which lie near their line of march. Some of them were found also on the Lower Amazons, and have been noticed in former chapters of this narrative. Of the remainder, the most remarkable is the Macaco barrigudo, or big-bellied monkey of the Portuguese colonists, a species of Lagothrix. The genus is closely allied to the Coaitás, or spider monkeys, having, like them, exceedingly strong

and flexible tails, which are furnished underneath with a naked palm like a hand, for grasping. The Barrigudos, however, are very bulky animals, whilst the spider monkeys are remarkable for the slenderness of their bodies and limbs. I obtained specimens of what have been considered two species, one (L. olivaceus of Spix ?) having the head clothed with gray, the other (L. Humboldtii) with black fur. They both live together in the same places, and are probably only differently-coloured individuals of one and the same species. I sent home a very large male of one of these kinds, which measured twenty-seven inches in length of trunk, the tail being twenty-six inches long ; it was the largest monkey I saw in America, with the exception of a black Howler, whose body was twenty-eight inches in height. The skin of the face in the Barrigudo is black and wrinkled, the forehead is low, with the eye-brows projecting, and, in short, the features altogether resemble in a striking manner those of an old negro. In the forests, the Barrigudo is not a very active animal ; it lives exclusively on fruits, and is much persecuted by the Indians, on account of the excellence of its flesh as food. From information given me by a collector of birds and mammals, whom I employed, and who resided a long time amongst the Tucuna Indians, near Tabatinga, I calculated that one horde of this tribe, 200 in number, destroyed 1200 of these monkeys annually for food. The species is very numerous in the forests of the higher lands, but, owing to long persecution, it is now seldom seen in the neighbourhood of the larger villages. It is not found at all on the Lower Amazons.

Its manners in captivity are grave, and its temper mild and confiding, like that of the Coaitás. Owing to these traits, the Barrigudo is much sought after for pets ; but it is not hardy like the Coaitás, and seldom survives a passage down the river to Pará.

*Marmosets.*—It now only remains to notice the Marmosets, which form the second family of American monkeys. Our old friend Midas ursulus, of Pará and the Lower Amazons, is not found on the Upper river, but in its stead a closely-allied species presents itself, which appears to be the Midas rufoniger of Gervais, whose mouth is bordered with longish white hairs. The habits of this species are the same as those of the M. ursulus, indeed it seems probable that it is a form or race of the same stock, modified to suit the altered local conditions under which it lives. One day, whilst walking along a forest pathway, I saw one of these lively little fellows miss his grasp as he was passing from one tree to another along with his troop. He fell head foremost, from a height of at least fifty feet, but managed cleverly to alight on his legs in the pathway ; quickly turning round he gave me a good stare for a few moments, and then bounded off gaily to climb another tree. At Tunantins, I shot a pair of a very handsome species of Marmoset, the M. rufiventer, I believe, of zoologists. Its coat was very glossy and smooth ; the back deep brown, and the underside of the body of rich black and reddish hues. A third species (found at Tabatinga, 200 miles further west) is of a deep black colour, with the exception of a patch of white hair around its mouth. The little animal, at a short distance, looks

as though it held a ball of snow-white cotton in its teeth. The last I shall mention is the Hapale pygmæus, one of the most diminutive forms of the monkey order. I obtained, near St. Paulo, three full-grown specimens, which measured only seven inches in length of body. The pretty Lilliputian face is furnished with long brown whiskers, which are naturally brushed back over the ears. The general colour of the animal is brownish-tawny, but the tail is elegantly barred with black. I was surprised, on my return to England, to learn that the pigmy marmoset was found also in Mexico, no other Amazonian monkey being known to wander far from the great river plain. Thus the smallest, and apparently the feeblest, species of the whole order, is one which has, by some means, become the most widely dispersed.

*The Jupurá.*—A curious animal, known to naturalists as the Kinkajou, but called Jupurá by the Indians of the Amazons, and considered by them as a kind of monkey, may be mentioned in this place. It is the Cercoleptes caudivolvus of zoologists, and has been considered by some authors as an intermediate form between the Lemur family of apes and the plantigrade Carnivora, or Bear family. It has decidedly no close relationship to either of the groups of American monkeys, having six cutting teeth to each jaw, and long claws intead of nails, with extremities of the usual shape of paws instead of hands. Its muzzle is conical and pointed, like that of many Lemurs of Madagascar; the expression of its countenance, and its habits and actions, are also very similar to those of Lemurs. Its tail is

very flexible towards the tip, and is used to twine round branches in climbing. I did not see or hear anything of this animal whilst residing on the Lower Amazons, but on the banks of the Upper river, from the Teffé to Peru, it appeared to be rather common. It is nocturnal in its habits, like the owl-faced monkeys, although, unlike them, it has a bright, dark eye. I once saw it in considerable numbers, when on an excursion with an Indian companion along the low Ygapó shores of the Teffé, about twenty miles above Ega. We slept one night at the house of a native family living in the thick of the forest, where a festival was going on, and there being no room to hang our hammocks under shelter, on account of the number of visitors, we lay down on a mat in the open air, near a shed which stood in the midst of a grove of fruit-trees and pupunha palms. After midnight, when all became still, after the uproar of holiday-making, as I was listening to the dull, fanning sound made by the wings of impish hosts of vampire bats crowding round the Cajú trees, a rustle commenced from the side of the woods, and a troop of slender, long-tailed animals were seen against the clear moonlit sky, taking flying leaps from branch to branch through the grove. Many of them stopped at the pupunha trees, and the hustling, twittering, and screaming, with sounds of falling fruits, showed how they were employed. I thought, at first, they were Nyctipitheci, but they proved to be Jupurás, for the owner of the house early next morning caught a young one, and gave it to me. I kept this as a pet animal for several weeks, feeding it on bananas and mandioca-

meal mixed with treacle. It became tame in a very short time, allowing itself to be caressed, but making a distinction in the degree of confidence it showed between myself and strangers. My pet was unfortunately killed by a neighbour's dog, which entered the room where it was kept. The animal is so difficult to obtain alive, its place of retreat in the day-time not being known to the natives, that I was unable to procure a second living specimen.

As I shall not have occasion again to enter on the subject of monkeys, a few general remarks will be here in place, as a summary of my observations on this important order of animals in the Amazons region. The total number of species of monkeys which I found inhabiting the margins of the Upper and Lower Amazons, was thirty-eight. They belonged to twelve different genera, forming two distinct families, the number of genera and families, here as well as in other orders of animals or plants, expressing roughly the amount of diversity existing with regard to forms. All the New World genera of apes, except one (Eriodes, closely allied to the Coaitás, but having claw-shaped nails to the fingers), are represented in the Amazons region. With these ample materials before us, let us draw a comparison between the monkeys of the new continent, and their kindred of the Old World. It seems highly probable that the larger land areas, both continents and islands, on the surface of our globe, became separated pretty nearly as they now are, soon after the first forms of this group of animals came into existence: it will

be interesting, therefore, to see how differently the subsequent creations of species have proceeded in each of the separated areas.

The American monkeys are distinguished, as a body, from all those found in the Old World. Upon this point, there is no difference of opinion amongst modern zoologists. It is not probable, therefore, that species of the one continent have passed over to the other, since these great tracts of land received their present inhabitants of this order. The American productions present a cluster of forms, namely, about eighty-six species, separated into thirteen genera, which although greatly diversified amongst themselves, in no case show signs of near relationship to any of the still more diversified forms of the same order belonging to the eastern hemisphere. One of the two American families (Cebidæ) has thirty-six teeth, whilst the corresponding family (Pithecidæ) of Old World apes has, like man, only thirty-two teeth; the difference arising from the Cebidæ having an additional false molar tooth* to each side of both jaws. This important character is constant throughout all the varied forms of which the Cebidæ family is composed; being equally present in the prehensile-tailed group, with its four genera containing twenty-seven species, differing in form and clothing, shape of claws, mental characteristics, and condition of thumb of the anterior hands; and in the true Cebi and the group of Sagouins, with six genera and twenty-four species, including day apes and night apes, short

* False molars, or premolars, differ from true molars, through being preceded in growth by milk teeth.

furred and long-haired apes, apes with excessively long tails, and apes with rudimentary tails. The second American family, the Marmosets, have thirty-two teeth, like the Old World monkeys and man ; but this identity of number arises from one of the true molars being absent ; the Marmosets have three premolar teeth, like the Cebidæ, and are therefore quite as far removed as the Cebidæ from all the forms of the Old World. They are, moreover, a low type of apes, having a smooth brain, and claws instead of nails, although they are gentle and playful in disposition, and have a visage which presents an open facial angle.

The Old World apes, as just observed, are far more diversified amongst themselves, than are those of the New World. They form, in the first place, two widely distinct groups or sub-orders, Pithecidæ and Lemurs, and comprise about 125 species, divided into twenty-one genera. The Lemur group contains a remarkably great diversity of forms ; this is shown by their being naturally divisible into four families,* and twelve genera, although containing only twenty-five species. Their teeth are very irregular in number and position, but never correspond with those of the Pithecidæ or Cebidæ. These four families, in structure, are more widely separated from each other than are the two American groups of the same denomination. The Lemurs also contain a number of anomalous or isolated forms, which, by their teeth, number of teats, and other features, connect the monkeys with other and lower orders of the mammal class ; namely, the Rodents, the

* True Lemurs, Tarsiens, Aye-Ayes, and Galeopitheci.

Insectivora, and the Bats. All the typical Lemurs, which constitute the great majority of the family, inhabit exclusively the Island of Madagascar.

The Pithecidæ are divisible into three groups, which again are much more distinct from each other than the subordinate groups of Cebidæ. These are the Anthropoid section, to which some zoologists consider man himself belongs, comprising the Gorilla, the Chimpanzee, the Orangs and the Gibbons ; the Guenons (which, in their forms, tempers, and habits, resemble the Cebidæ), and lastly, the Baboons, whose extreme forms—the dog-faced species, with nose extending to the tip of the muzzle—seem like a degradation of the monkey type. There is nothing at all resembling the Anthropoid apes and the Baboons existing on the American continent. The Guenons, too, have only a superficial resemblance to American monkeys ; for they have all thirty-two teeth, nostrils opening in a downward direction (instead of on the sides, like the Cebidæ and Marmosets), and are, moreover, linked to the Baboons through intermediate forms (Macacus), and the possession of callosities on the breech, and other signs of blood-relationship.

A few more words on the peculiar way in which these groups of monkeys are distributed over the earth's surface. We may consider, in connection with this subject, the great land masses of the warmer parts of the earth to be four in number. 1. Australia, with New Guinea and its neighbouring islands : 2. Madagascar : 3. America : 4. The Continental mass of the Old World, comprising Europe, Africa, Asia, and the Islands of the Malay Archipelago, which latter are connected with

Asia by a shallow sea, whilst they are separated from New Guinea by a channel of very deep water; the shallow sea pointing to a former, but recent, union of the lands which it connects, the deep channel a complete and enduring severance of the lands which it separates. Now, with regard to monkeys, these four land masses seem to have had these animals allotted to them in the most capricious way possible, if we are to take for granted that the species were arbitrarily created on the lands where they are now found. Australia, with soil and climate as well adapted for Baboons as Africa, where they abound, and New Guinea, with rich humid forests as suitable for Orangs and Gibbons as the very similar island of Borneo, have, neither of them, a single species of native monkey. Madagascar possesses only Lemurs, the most lowly-organised group of apes, although the neighbouring continent of Africa contains numerous species of all families of Old World apes. America, as we have seen, has no Lemurs, and not a single representative of the Old World groups of the order, but is well peopled by genera and species belonging to two distinct groups peculiar to the continent. Lastly, the Old World continental mass, with a few anomalous forms of Lemurs scattered here and there, is the exclusive home of the whole of the Pithecidæ family, which presents a series of forms graduating from the debased Baboon to the Gorilla, which some zoologists consider to approach near to man in his organisation.

What does all this mean? Why are the different forms apportioned in this way to the various lands of the earth? Why is Australia with New Guinea desti-

tute of monkeys, and why should Madagascar have stopped short at Lemurs, whilst America has gone on to prehensile-tailed Cebidæ, and the Old-World continent continued to Gibbons, Orangs, Chimpanzee, and Gorilla? Is it that the greater land masses have seen a larger amount of geological and climatal changes with corresponding changes in the geographical relations of species? Moreover, why should the smaller groups of the order be confined to smaller areas within the greater areas peopled by the families to which they belong? For, it must be added, the true Lemurs are confined to Madagascar, the Gibbons and others to South Eastern Asia, the dog-faced baboons to Africa, and, as we have seen, the scarlet-faced monkeys to a limited area on the Upper Amazons. May we be allowed to explain the absence of these animals from New Guinea with Australia, by the supposition that those lands were separated from South Eastern Asia before the first forms of the order came into existence? If so, it may be concluded that Madagascar became separated from Africa, and America from the continental mass of the old world before the Pithecidæ originated. But, if these explanations, founded on natural causes, be entertained, we commit ourselves, by the fact of entertaining them, to the admission that natural causes are competent to explain the existence or non-existence of forms in a given area, and why may not the exercise of our reason, founded on carefully observed and collated facts, be carried a step farther, namely to the origin of the species of monkeys themselves? I have already shown how singularly species of monkeys vary in different localities, and have

given the striking case of the white and red-haired Uakarís. If these two forms, which are considered by the most eminent naturalists as distinct species, have originated, as the facts of their distribution plainly tell us they have, from one and the same stock, why may not the various species of Lemurs, of Baboons, of Gibbons, and so forth, given the necessary amount of time and climatal changes, have originated in the same way? And if we can thus account for the origin of the species of one genus, on what grounds can we deny that the genera of the same family, or the families of the same order, have also proceeded from a common stock? I throw out these suggestions simply for the consideration of thoughtful readers, but must add, that unless the common origin, at least, of the species of a family be admitted, the problem of the distribution of monkeys over the earth's surface must remain an inexplicable mystery, whilst, if admitted, a flood of light illuminates the subject, and promises an early solution to honest and patient investigation. These questions, also, show how interesting and difficult are the problems which Natural History, granted the right and ability of the human mind to deal with them, has to solve.

It is a suggestive fact that all the fossil monkeys which have been found in Europe and America, belong in each case to the types which are still peculiar to the continent which they inhabit. The European fossils are all of the Pithecidæ family, the South American all belong to the Cebidæ and Marmoset families. The separation of the two continental masses (at least of their warm zones) must therefore be of great geological

antiquity. It is interesting to trace how the diversification of forms (if the expression may be allowed), since the separation, has gone on in Tropical America. What wide divergence as to size, forms, habits, and mental dispositions, between the silver marmoset so small that it may be inclosed in the two hands, and the strong and savage black Howler, nearly two feet and a half in length of trunk! Yet there has been no direct advance in the organisation of the order towards a higher type, such as is exhibited in the old world. America, for her share, has produced the most perfectly arboreal monkey in the world; but beyond the perfection of the arboreal type she does not go. The retention of arboreal forms throughout long geological ages, may teach geologists that there must always have been extensive land areas covered by forests on the site of the tropical zone of America. It is curious to reflect, in conjunction with the fact of the advance of the American Quadrumana having halted at a low stage, that ethnologists have almost unanimously come to the conclusion that the race of men now inhabiting the American continent are not Autochthones of America, the land of the Cebidæ, but immigrants from the Old World continent, the land of the Anthropoid group of the order Quadrumana.

*Bats.*—The only other mammals that I shall mention are the bats, which exist in very considerable numbers and variety in the forest, as well as in the buildings of the villages. Many small and curious species living in the woods, conceal themselves by day under the broad leaf-blades of Heliconiæ and other plants which grow

in shady places; others cling to the trunks of trees. Whilst walking through the forest in the daytime, especially along gloomy ravines, one is almost sure to startle bats from their sleeping-places; and at night they are often seen in great numbers flitting about the trees on the shady margins of narrow channels. I captured altogether, without giving especial attention to bats, sixteen different species at Ega.

*The Vampire Bat.* — The little gray bloodsucking Phyllostoma, mentioned in a former chapter as found in my chamber at Caripí, was not uncommon at Ega, where everyone believes it to visit sleepers and bleed them in the night. But the vampire was here by far the most abundant of the family of leaf-nosed bats. It is the largest of all the South American species, measuring twenty-eight inches in expanse of wing. Nothing in animal physiognomy can be more hideous than the countenance of this creature when viewed from the front; the large, leathery ears standing out from the sides and top of the head, the erect spear-shaped appendage on the tip of the nose, the grin and the glistening black eye all combining to make up a figure that reminds one of some mocking imp of fable. No wonder that imaginative people have inferred diabolical instincts on the part of so ugly an animal. The vampire, however, is the most harmless of all bats, and its inoffensive character is well known to residents on the banks of the Amazons. I found two distinct species of it, one having the fur of a blackish colour, the other of a ruddy hue, and ascertained that both feed chiefly on fruits. The church at Ega was the head-quarters of

both kinds ; I used to see them, as I sat at my door during the short evening twilights, trooping forth by scores from a large open window at the back of the altar, twittering cheerfully as they sped off to the borders of the forest. They sometimes enter houses ; the first time I saw one in my chamber, wheeling heavily round and round, I mistook it for a pigeon, thinking that a tame one had escaped from the premises of one of my neighbours. I opened the stomachs of several of these bats, and found them to contain a mass of pulp and seeds of fruits, mingled with a few remains of insects.* The natives say they devour ripe cajús and guavas on trees in the gardens, but on comparing the seeds taken from their stomachs with those of all cultivated trees at Ega, I found they were unlike any of them ; it is therefore probable that they generally resort to the forest to feed, coming to the village in the morning to sleep, because they find it more secure from animals of prey than their natural abodes in the woods.

*Birds.*—I have already had occasion to mention several of the more interesting birds found in the Ega district. The first thing that would strike a new-comer in the forests of the Upper Amazons would be the general scarcity of birds ; indeed, it often happened that I did not meet with a single bird during a whole day's ramble in the richest and most varied parts of the woods. Yet

* The remains of insects belonged to species of Scarites (Coleoptera) having blunt maxillary blades, several of which fly abroad in great numbers on warm nights.

the country is tenanted by many hundred species, many of which are, in reality, abundant, and some of them conspicuous from their brilliant plumage. The cause of their apparent rarity is to be sought in the sameness and density of the thousand miles of forest which constitute their dwelling-place. The birds of the country are gregarious, at least during the season when they are most readily found; but the frugivorous kinds are to be met with only when certain wild fruits are ripe, and to know the exact localities of the trees requires months of experience. It would not be supposed that the insectivorous birds are also gregarious; but they are so, numbers of distinct species, belonging to many different families, joining together in the chase or search of food. The proceedings of these associated bands of insect-hunters are not a little curious, and merit a few remarks.

Whilst hunting along the narrow pathways that are made through the forest in the neighbourhood of houses and villages, one may pass several days without seeing many birds; but now and then the surrounding bushes and trees appear suddenly to swarm with them. There are scores, probably hundreds of birds, all moving about with the greatest activity—woodpeckers and Dendrocolaptidæ (from species no larger than a sparrow to others the size of a crow) running up the tree trunks; tanagers,* ant-thrushes, humming-birds, fly-catchers, and barbets flitting about the leaves and lower branches.

* Tachyphonus surinamus and cristatus, Tanagrella elegantissima. I very often found fruit-eating birds, such as Cassicus icteronotus and Capito Amazoninus mingled with these bands.

The bustling crowd loses no time, and although moving in concert, each bird is occupied, on its own account, in searching bark or leaf or twig; the barbets visiting every clayey nest of termites on the trees which lie in the line of march. In a few minutes the host is gone, and the forest path remains deserted and silent as before. I became, in course of time, so accustomed to this habit of birds in the woods near Ega, that I could generally find the flock of associated marauders whenever I wanted it. There appeared to be only one of these flocks in each small district; and, as it traversed chiefly a limited tract of woods of second growth, I used to try different paths until I came up with it.

The Indians have noticed these miscellaneous hunting parties of birds, but appear not to have observed that they are occupied in searching for insects. They have supplied their want of knowledge, in the usual way of half-civilised people, by a theory which has degenerated into a myth, to the effect that the onward moving bands are led by a little grey bird, called the Papá-uirá, which fascinates all the rest, and leads them a weary dance through the thickets. There is certainly some appearance of truth in this explanation; for sometimes stray birds, encountered in the line of march, are seen to be drawn into the throng, and purely frugivorous birds are now and then found mixed up with the rest, as though led away by some will-o'-the-wisp. The native women, even the white and half-caste inhabitants of the towns, attach a superstitious value to the skin and feathers of the Papá-uirá, believing that if they keep them in their clothes' chest, the relics will have the

effect of attracting for the happy possessors a train of lovers and followers. These birds are consequently in great demand in some places, the hunters selling them at a high price to the foolish girls, who preserve the bodies by drying flesh and feathers together in the sun. I could never get a sight of this famous little bird in the forest. I once employed Indians to obtain specimens for me; but, after the same man (who was a noted woodsman) brought me, at different times, three distinct species of birds as the Papá-uirá, I gave up the story as a piece of humbug. The simplest explanation appears to be this; that the birds associate in flocks from the instinct of self-preservation, and in order to be a less easy prey to hawks, snakes, and other enemies than they would be if feeding alone.

*Toucans.* — *Cuvier's Toucan.* — Of this family of birds, so conspicuous from the great size and light structure of their beaks, and so characteristic of Tropical American forests, five species* inhabit the woods of Ega. The largest of all the Toucans found on the Amazons, namely, the Ramphastos toco, called by the natives Tocáno pacova, from its beak resembling in size and shape a banana or pacova, appears not to reach so far up the river as Ega. It is abundant near Pará, and is found also on the low islands of the Rio Negro, near Barra, but does not seem to range much farther to the west. The commonest species at Ega is Cuvier's

* Ramphastos Cuvieri, Pteroglossus Beauharnaisii, Pt. Langsdorfii, Pt. castanotis, Pt. flavirostris. Further westward, namely, near St. Paulo, a sixth species makes its appearance, the Pteroglossus Humboldtii.

Toucan, a large bird, distinguished from its nearest relatives by the feathers at the bottom of the back being of a saffron hue instead of red. It is found more or less numerously throughout the year, as it breeds in the neighbourhood, laying its eggs in holes of trees, at a great height from the ground. During most months of the year, it is met with in single individuals or small flocks, and the birds are then very wary. Sometimes one of these little bands of four or five is seen perched, for hours together, amongst the topmost branches of high trees, giving vent to their remarkably loud, shrill, yelping cries, one bird, mounted higher than the rest, acting, apparently, as leader of the inharmonious chorus ; but two of them are often heard yelping alternately, and in different notes. These cries have a vague resemblance to the syllables Tocáno, Tocáno, and hence the Indian name of this genus of birds. At these times it is difficult to get a shot at Toucans, for their senses are so sharpened that they descry the hunter before he gets near the tree on which they are perched, although he may be half-concealed amongst the underwood, 150 feet below them. They stretch their necks downwards to look beneath, and on espying the least movement amongst the foliage, fly off to the more inaccessible parts of the forest. Solitary Toucans are sometimes met with at the same season, hopping silently up and down the larger boughs, and peering into crevices of the tree-trunks. They moult in the months from March to June, some individuals earlier, others later. This season of enforced quiet being passed, they make their appearance suddenly in the dry

forest, near Ega, in large flocks, probably, assemblages of birds gathered together from the neighbouring Ygapó forests, which are then flooded and cold. The birds have now become exceedingly tame, and the troops travel with heavy laborious flight from bough to bough amongst the lower trees. They thus become an easy prey to hunters, and every one at Ega, who can get a gun of any sort and a few charges of powder and shot, or a blow-pipe, goes daily to the woods to kill a few brace for dinner; for, as already observed, the people of Ega live almost exclusively on stewed and roasted Toucans during the months of June and July. The birds are then very fat, and the meat exceedingly sweet and tender. I did not meet with Cuvier's Toucan on the Lower Amazons; in that region, the sulphur and white-breasted Toucan (Ramphastos Vitellinus) seems to take its place, this latter species, on the other hand, being quite unknown on the Upper Amazons. It is probable they are local modifications of one and the same stock.

No one, on seeing a Toucan, can help asking what is the use of the enormous bill, which, in some species, attains a length of seven inches, and a width of more than two inches. A few remarks on this subject may be here introduced. The early naturalists, having seen only the bill of a Toucan, which was esteemed as a marvellous production by the *virtuosi* of the sixteenth and seventeenth centuries, concluded that the bird must have belonged to the aquatic and web-footed order, as this contains so many species of remarkable development of beak, adapted for seizing fish. Some travellers also related fabulous stories of Toucans resorting to

the banks of rivers to feed on fish, and these accounts also encouraged the erroneous views of the habits of the birds, which, for a long time, prevailed. Toucans, however, are now well known to be eminently arboreal birds, and to belong to a group (including trogons, parrots, and barbets*), all of whose members are fruit-eaters. On the Amazons, where these birds are very common, no one pretends ever to have seen a Toucan walking on the ground in its natural state, much less acting the part of a swimming or wading bird. Professor Owen found, on dissection, that the gizzard in Toucans is not so well adapted for the trituration of food as it is in other vegetable feeders, and concluded, therefore, as Broderip had observed the habit of chewing the cud in a tame bird, that the great toothed bill was useful in holding and re-masticating the food. The bill can scarcely be said to be a very good contrivance for seizing and crushing small birds, or taking them from their nests in crevices of trees, habits which have been imputed to Toucans by some writers. The hollow, cellular structure of the interior of the bill, its curved and clumsy shape, and the deficiency of force and precision when it is used to seize objects, suggest a want of fitness, if this be the function of the member. But fruit is undoubtedly the chief food of Toucans, and it is in reference to their mode of obtaining it that the use of their uncouth bills is to be sought.

Flowers and fruits on the crowns of the large trees of South American forests grow, principally, towards the end of slender twigs, which will not bear any con-

* Capitoninæ, G. R. Gray.

siderable weight ; all animals, therefore, which feed upon fruit, or on insects contained in flowers, must, of course, have some means of reaching the ends of the stalks from a distance. Monkeys obtain their food by stretching forth their long arms and, in some instances, their tails, to bring the fruit near to their mouths. Humming-birds are endowed with highly-perfected organs of flight, with corresponding muscular development, by which they are enabled to sustain themselves on the wing before blossoms whilst rifling them of their contents. These strong-flying creatures, however, will, whenever they get a chance, remain on their perches whilst probing neighbouring flowers for insects. Trogons have feeble wings, and a dull, inactive temperament. Their mode of obtaining food is to station themselves quietly on low branches in the gloomy shades of the forest, and eye the fruits on the surrounding trees, darting off, as if with an effort, every time they wish to seize a mouthful, and returning to the same perch. Barbets (Capitoninæ) seem to have no especial endowment, either of habits or structure, to enable them to seize fruits ; and in this respect they are similar to the Toucans, if we leave the bill out of question, both tribes having heavy bodies, with feeble organs of flight, so that they are disabled from taking their food on the wing. The purpose of the enormous bill here becomes evident. Barbets and Toucans are very closely related ; indeed a genus has lately been discovered towards the head waters of the Amazons,*

* Tetragonops. Dr. Sclater has lately given a figure of this bird in the Ibis, vol. iii. p. 182.

which tends to link the two families together; the superior length of the Toucan's bill gives it an advantage over the Barbet, with its small, conical beak; it can reach and devour immense quantities of fruit whilst remaining seated, and thus its heavy body and gluttonous appetite form no obstacles to the prosperity of the species. It is worthy of note, that the young of the Toucan has a very much smaller beak than the full-grown bird. The relation between the extraordinarily lengthened bill of the Toucan and its mode of obtaining food, is precisely similar to that between the long neck and lips of the Giraffe and the mode of browsing of the animal. The bill of the Toucan can scarcely be considered a very perfectly-formed instrument for the end to which it is applied, as here explained; but nature appears not to shape organs at once for the functions to which they are now adapted, but avails herself, here of one already-existing structure or instinct, there of another, according as they are handy when need for their further modification arises.

One day, whilst walking along the principal pathway in the woods near Ega, I saw one of these Toucans seated gravely on a low branch close to the road, and had no difficulty in seizing it with my hand. It turned out to be a runaway pet bird; no one, however, came to own it, although I kept it in my house for several months. The bird was in a half-starved and sickly condition, but after a few days of good living it recovered health and spirits, and became one of the most amusing pets imaginable. Many excellent accounts of the habits of tame Toucans, have been published, and

therefore I need not describe them in detail, but I do not recollect to have seen any notice of their intelligence and confiding disposition under domestication, in which qualities my pet seemed to be almost equal to parrots. I allowed Tocáno to go free about the house, contrary to my usual practice with pet animals; he never, however, mounted my working-table after a smart correction which he received the first time he did so. He used to sleep on the top of a box in a corner of the room, in the usual position of these birds, namely, with the long tail laid right over on the back, and the beak thrust underneath the wing. He ate of everything that we eat; beef, turtle, fish, farinha, fruit, and was a constant attendant at our table—a cloth spread on a mat. His appetite was most ravenous, and his powers of digestion quite wonderful. He got to know the meal hours to a nicety, and we found it very difficult, after the first week or two, to keep him away from the dining-room, where he had become very impudent and troublesome. We tried to shut him out by enclosing him in the back-yard, which was separated by a high fence from the street on which our front door opened, but he used to climb the fence and hop round by a long circuit to the dining-room, making his appearance with the greatest punctuality as the meal was placed on the table. He acquired the habit, afterwards, of rambling about the street near our house, and one day he was stolen, so we gave him up for lost. But, two days afterwards, he stepped through the open doorway at dinner hour, with his old gait, and sly, magpie-like expression, having escaped from the house where he had been guarded by the person who

had stolen him, and which was situated at the further end of the village.

*The Curl-crested Toucan* (*Pteroglossus Beauharnaisii*).—Of the four smaller Toucans or Arassarís found near Ega, the Pteroglossus flavirostris is perhaps the most beautiful in colours, its breast being adorned with broad belts of rich crimson and black ; but the most curious species, by far, is the Curl-crested, or Beauharnais Toucan. The feathers on the head of this singular

Curl-crested Toucan.

bird are transformed into thin, horny plates, of a lustrous black colour, curled up at the ends, and resembling shavings of steel or ebony wood : the curly crest being arranged on the crown in the form of a wig. Mr. Wallace and I first met with this species, on ascending the Amazons, at the mouth of the Solimoens ; from that point it continues as a rather common bird on the terra firma, at least on the south side of the river, as far as Fonte Boa, but I did not hear of its being found further to the west. It appears in large

flocks in the forest near Ega in May and June, when it has completed its moult. I did not find these bands congregated at fruit-trees, but always wandering through the forest, hopping from branch to branch amongst the lower trees, and partly concealed amongst the foliage. None of the Arassarís, to my knowledge, make a yelping noise like that uttered by the larger Toucans (Ramphastos); the notes of the curl-crested species are very singular, resembling the croaking of frogs. I had an amusing adventure one day with these birds. I had shot one from a rather high tree in a dark glen in the forest, and leaving my gun leaning against a tree-trunk in the pathway, went into the thicket where the bird had fallen, to secure my booty. It was only wounded, and on my attempting to seize it, it set up a loud scream. In an instant, as if by magic, the shady nook seemed alive with these birds, although there was certainly none visible when I entered the thicket. They descended towards me, hopping from bough to bough, some of them swinging on the loops and cables of woody lianas, and all croaking and fluttering their wings like so many furies. Had I had a long stick in my hand I could have knocked several of them over. After killing the wounded one I rushed out to fetch my gun, but, the screaming of their companion having ceased, they remounted the trees, and before I could reload, every one of them had disappeared.

*Insects.*—Upwards of 7000 species of insects were found in the neighbourhood of Ega. I must confine myself, in this place, to a few remarks on the order

Lepidoptera, and on the ants, several kinds of which, found chiefly on the Upper Amazons, exhibit the most extraordinary instincts.

I found about 550 distinct species of butterflies at Ega. Those who know a little of Entomology will be able to form some idea of the riches of the place in this department, when I mention that eighteen species of true Papilio (the swallow-tail genus) were found within ten minutes' walk of my house. No fact could speak more plainly for the surpassing exuberance of the vegetation, the varied nature of the land, the perennial warmth and humidity of the climate. But no description can convey an adequate notion of the beauty and diversity in form and colour of this class of insects in the neighbourhood of Ega. I paid especial attention to them, having found that this tribe was better adapted than almost any other group of animals or plants, to furnish facts in illustration of the modifications which all species undergo in nature, under changed local conditions. This accidental superiority is owing partly to the simplicity and distinctness of the specific characters of the insects, and partly to the facility with which very copious series of specimens can be collected and placed side by side for comparison. The distinctness of the specific characters is due probably to the fact that all the superficial signs of change in the organisation are exaggerated, and made unusually plain, by affecting the framework, shape, and colour of the wings, which, as many anatomists believe, are magnified extensions of the skin around the breathing orifices of the thorax of the insects. These expansions are clothed with minute

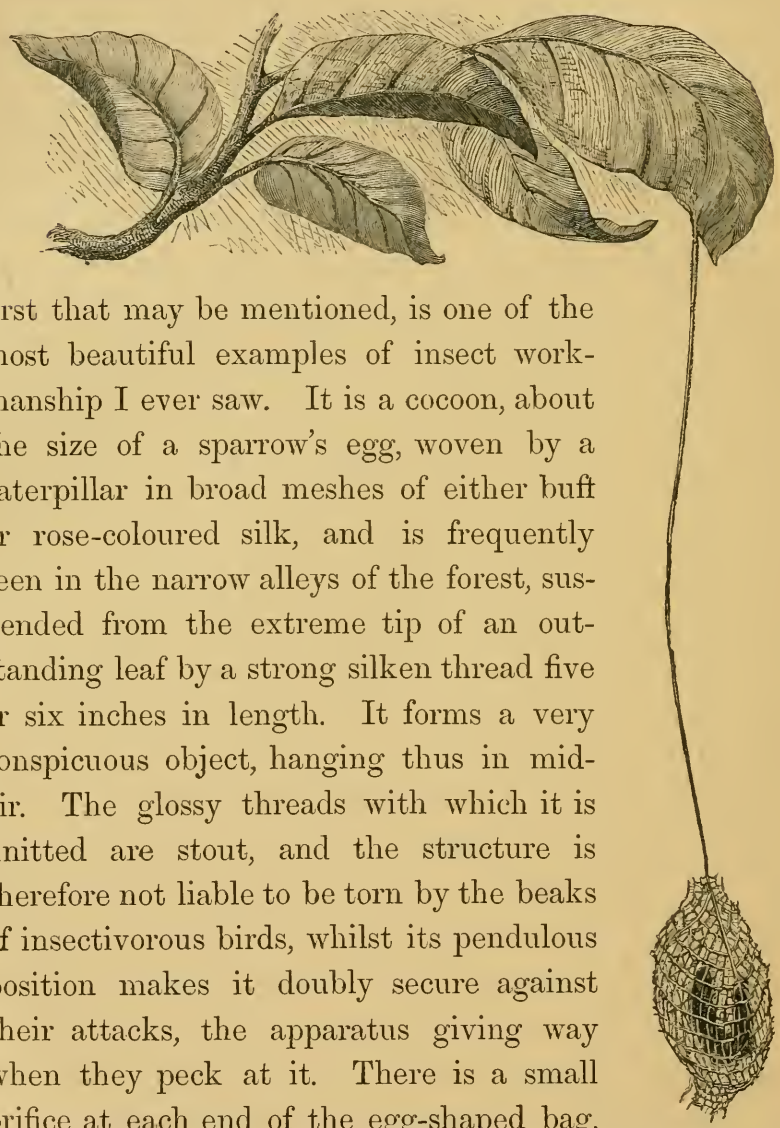
feathers or scales, coloured in regular patterns, which vary in accordance with the slightest change in the conditions to which the species are exposed. It may be said, therefore, that on these expanded membranes Nature writes, as on a tablet, the story of the modifications of species, so truly do all changes of the organisation register themselves thereon. Moreover, the same colour-patterns of the wings generally show, with great regularity, the degrees of blood-relationship of the species. As the laws of Nature must be the same for all beings, the conclusions furnished by this group of insects must be applicable to the whole organic world; therefore, the study of butterflies—creatures selected as the types of airiness and frivolity—instead of being despised, will some day be valued as one of the most important branches of Biological science.

I have mentioned, in a former chapter, the general sultry condition of the atmosphere on the Upper Amazons, where the sea-breezes which blow from Pará to the mouth of the Rio Negro (1000 miles up stream) are unknown. This simple difference of meteorological conditions would hardly be thought to determine what genera of butterflies should inhabit each region, yet it does so in a very decisive manner. The Upper Amazons, from Ega upwards, and the eastern slopes of the Andes, whence so large a number of the most richly-coloured species of this tribe have been received in Europe, owe the most ornamental part of their insect population to the absence of strong and regular winds. Nineteen of the most handsome genera of Ega, containing altogether about 100 species, are either entirely

absent or very sparingly represented on the Lower Amazons within reach of the trade winds. The range of these nineteen genera is affected by a curiously complicated set of circumstances. In all the species of which they are composed, the males are more than 100 to one more numerous than the females, and being very richly coloured, whilst the females are of dull hues, they spend their lives in sporting about in the sunlight, imbibing the moisture which constitutes their food, from the mud on the shores of streams, their spouses remaining hid in the shades of the forest. The very existence of these species depends on the facilities which their males have for indulgence in the pleasures of this sunshiny life. The greatest obstacle to this is the prevalence of strong winds, which not only dries rapidly all moisture in open places, but prevents the richly-attired dandies from flying daily to their feeding-places. I noticed this particularly whilst residing at Santarem, where the moist margins of water, localities which on the Upper Amazons swarm with these insects, were nearly destitute of them; and at Villa Nova (where a small number exists) I have watched them buffeting with the strong winds at the commencement of the dry season, and, as the dryness increased, disappearing from the locality. On ascending the Tapajos to the calm and sultry banks of the Cuparí, a great number of these insects re-appeared, most of them being the same as those found on the Upper Amazons, thus showing clearly that their existence in the district depended on the absence of winds.

Before proceeding to describe the ants, a few remarks

may be made on the singular cases and cocoons woven by the caterpillars of certain moths found at Ega. The



Suspended cocoon of Moth.

first that may be mentioned, is one of the most beautiful examples of insect workmanship I ever saw. It is a cocoon, about the size of a sparrow's egg, woven by a caterpillar in broad meshes of either buff or rose-coloured silk, and is frequently seen in the narrow alleys of the forest, suspended from the extreme tip of an outstanding leaf by a strong silken thread five or six inches in length. It forms a very conspicuous object, hanging thus in mid-air. The glossy threads with which it is knitted are stout, and the structure is therefore not liable to be torn by the beaks of insectivorous birds, whilst its pendulous position makes it doubly secure against their attacks, the apparatus giving way when they peck at it. There is a small orifice at each end of the egg-shaped bag, to admit of the escape of the moth when it changes from the little chrysalis which sleeps tranquilly in its airy cage. The moth is of a

dull slaty colour and belongs to the Lithosiide group of the silk-worm family (Bombycidæ). When the caterpillar begins its work, it lets itself down from the tip of the leaf which it has chosen, by spinning a thread of silk, the thickness of which it slowly increases as it descends. Having given the proper length to the cord, it proceeds to weave its elegant bag, placing itself in the centre and spinning rings of silk at regular intervals, connecting them at the same time by means of cross threads; so that the whole, when finished, forms a loose web, with quadrangular meshes of nearly equal size throughout. The task occupies about four days: when finished, the enclosed caterpillar becomes sluggish, its skin shrivels and cracks, and there then remains a motionless chrysalis of narrow shape, leaning against the sides of its silken cage.

Many other kinds are found at Ega belonging to the same cocoon-weaving family, some of which differ from the rest in their caterpillars possessing the art of fabricating cases with fragments of wood or leaves, in which they live secure from all enemies whilst they are feeding and growing. I saw many species of these; some of them knitted together, with fine silken threads, small bits of stick, and so made tubes similar to those of caddice-worms; others (Saccophora) chose leaves for the same purpose, forming with them an elongated bag open at both ends, and having the inside lined with a thick web. The tubes of full-grown caterpillars of Saccophora are two inches in length, and it is at this stage of growth that I have generally seen them. They feed on the leaves of Melastomæ, and as, in crawling,

the weight of so large a dwelling would be greater than the contained caterpillar could sustain, the insect

Sack-bearing Caterpillar (Saccophora).

attaches the case by one or more threads to the leaves or twigs near which it is feeding.

*Foraging Ants.*—Many confused statements have been published in books of travel, and copied in Natural History works, regarding these ants, which appear to have been confounded with the Saüba, a sketch of whose habits has been given in the first chapter of this work. The Saüba is a vegetable feeder, and does not attack other animals; the accounts that have been published regarding carnivorous ants which hunt in vast armies,

exciting terror wherever they go, apply only to the Ecitons, or foraging ants, a totally different group of this tribe of insects. The Ecitons are called Tauóca by the Indians, who are always on the look-out for their armies when they traverse the forest, so as to avoid being attacked. I met with ten distinct species of them, nearly all of which have a different system of marching; eight were new to science when I sent them to England. Some are found commonly in every part of the country, and one is peculiar to the open campos of Santarem; but, as nearly all the species are found together at Ega, where the forest swarmed with their armies, I have left an account of the habits of the whole genus for this part of my narrative. The Ecitons resemble, in their habits, the Driver-ants of Tropical Africa; but they have no close relationship with them in structure, and indeed belong to quite another sub-group of the ant-tribe.

Like many other ants, the communities of Ecitons are composed, besides males and females, of two classes of workers, a large-headed (worker-major) and a small-headed (worker-minor) class; the large-heads have, in some species, greatly lengthened jaws, the small-heads have jaws always of the ordinary shape; but the two classes are not sharply-defined in structure and function, except in two of the species. There is, in all of them a little difference amongst the workers regarding the size of the head; but in some species (E. legionis) this is not sufficient to cause a separation into classes, with division of labour; in others (E. hamata) the jaws are so monstrously lengthened in the worker-majors, that they are incapacitated from taking part in the labours which the

worker-minors perform; and again, in others (E. erratica and E. vastator), the difference is so great that the distinction of classes becomes complete, one acting the part of soldiers, and the other that of workers.* The peculiar feature in the habits of the Eciton genus is their hunting for prey in regular bodies, or armies. It is this which chiefly distinguishes them from the genus of common red stinging-ants (Myrmica), several species of which inhabit England, whose habit is to search for food in the usual irregular manner. All the Ecitons hunt in large organised bodies; but almost every species has its own special manner of hunting.

*Eciton rapax.*—One of the foragers, Eciton rapax, the giant of its genus, whose worker-majors are half-an-inch in length, hunts in single file through the forest. There is no division into classes amongst its workers, although the difference in size is very great, some being scarcely one-half the length of others. The head and jaws, however, are always of the same shape, and a gradation in size is presented from the largest to the

* There is one numerous genus of South American ants in which the two classes of workers are nearly always sharply defined in structure, not only the head, but other parts of the body, being strikingly different. This is the genus Cryptocerus, of which I found fifteen species, but in no case was able to discover the distinctive function of the worker-major class. The contrast between the two classes reaches its acme in C. discocephalus, whose worker-majors have a strange dish-shaped expansion on the crown of the head. All the species inhabit hollow twigs or branches of trees, the monstrous-headed individuals being always found quiescent and mixed with crowds of worker-minors. It cannot be considered wonderful that the function of worker-majors has not been discovered in exotic ants, when Huber, who devoted a life-time to the study of European ants, was unable to detect it in a common species, the Formica rufescens.

smallest, so that all are able to take part in the common labours of the colony. The chief employment of the species seems to be plundering the nests of a large and defenceless ant of another genus (Formica), whose mangled bodies I have often seen in their possession, as they were marching away. The armies of Eciton rapax are never very numerous.

*Eciton legionis.*—Another species, E. legionis, agrees with E. rapax in having workers not rigidly divisible into two classes; but it is much smaller in size, not differing greatly, in this respect, from our common English red ant (Myrmica rubra), which it also resembles in colour. The Eciton legionis lives in open places, and was seen only on the sandy campos of Santarem. The movements of its hosts were, therefore, much more easy to observe than those of all other kinds, which inhabit solely the densest thickets; its sting and bite, also, were less formidable than those of other species. The armies of E. legionis consist of many thousands of individuals, and move in rather broad columns. They are just as quick to break line, on being disturbed, and attack hurriedly and furiously any intruding object as the other Ecitons. The species is not a common one, and I seldom had good opportunities of watching its habits. The first time I saw an army, was one evening near sunset. The column consisted of two trains of ants, moving in opposite directions; one train empty-handed, the other laden with the mangled remains of insects, chiefly larvæ and pupæ of other ants. I had no difficulty in tracing the line to the spot from which they were conveying their

booty: this was a low thicket; the Ecitons were moving rapidly about a heap of dead leaves; but as the short tropical twilight was deepening rapidly, and I had no wish to be benighted on the lonely campos, I deferred further examination until the next day.

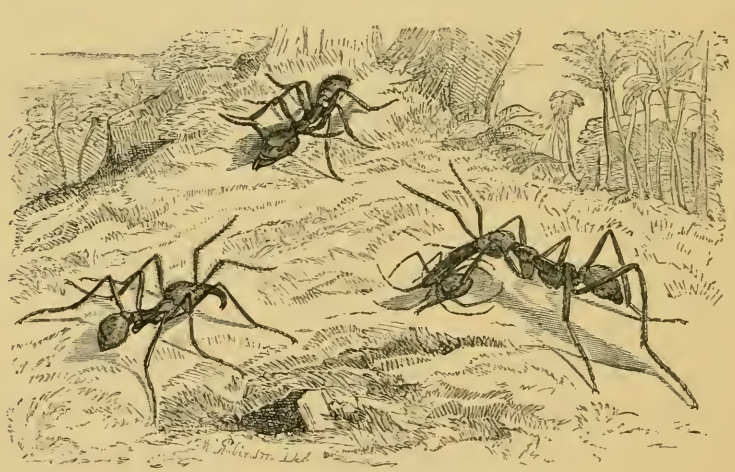
On the following morning, no trace of ants could be found near the place where I had seen them the preceding day, nor were there signs of insects of any description in the thicket; but at the distance of eighty or one hundred yards, I came upon the same army, engaged, evidently, on a razzia of a similar kind to that of the previous evening; but requiring other resources of their instinct, owing to the nature of the ground. They were eagerly occupied, on the face of an inclined bank of light earth, in excavating mines, whence, from a depth of eight or ten inches, they were extracting the bodies of a bulky species of ant, of the genus Formica. It was curious to see them crowding round the orifices of the mines, some assisting their comrades to lift out the bodies of the Formicæ, and others tearing them in pieces, on account of their weight being too great for a single Eciton; a number of carriers seizing each a fragment, and carrying it off down the slope. On digging into the earth with a small trowel near the entrances of the mines, I found the nests of the Formicæ, with grubs and cocoons, which the Ecitons were thus invading, at a depth of about eight inches from the surface. The eager freebooters rushed in as fast as I excavated, and seized the ants in my fingers as I picked them out, so that I had some difficulty in rescuing a few entire for specimens. In digging the numerous mines to get at

their prey, the little Ecitons seemed to be divided into parties, one set excavating, and another set carrying away the grains of earth. When the shafts became rather deep, the mining parties had to climb up the sides each time they wished to cast out a pellet of earth ; but their work was lightened for them by comrades, who stationed themselves at the mouth of the shaft, and relieved them of their burthens, carrying the particles, with an appearance of foresight which quite staggered me, a sufficient distance from the edge of the hole to prevent them from rolling in again. All the work seemed thus to be performed by intelligent co-operation amongst the host of eager little creatures ; but still there was not a rigid division of labour, for some of them, whose proceedings I watched, acted at one time as carriers of pellets, and at another as miners, and all shortly afterwards assumed the office of conveyors of the spoil.

In about two hours, all the nests of Formicæ were rifled, though not completely, of their contents, and I turned towards the army of Ecitons, which were carrying away the mutilated remains. For some distance there were many separate lines of them moving along the slope of the bank ; but a short distance off, these all converged, and then formed one close and broad column, which continued for some sixty or seventy yards, and terminated at one of those large termitariums already described in a former chapter as being constructed of a material as hard as stone. The broad and compact column of ants moved up the steep sides of the hillock in a continued stream ; many, which had hitherto

trotted along empty-handed, now turned to assist their comrades with their heavy loads, and the whole descended into a spacious gallery or mine, opening on the top of the termitarium. I did not try to reach the nest, which I supposed to lie at the bottom of the broad mine, and therefore in the middle of the base of the stony hillock.

*Eciton drepanophora.*—The commonest species of foraging ants are the Eciton hamata and E. drepanophora, two kinds which resemble each other so closely that it requires attentive examination to distinguish



Foraging ants (Eciton drepanophora).

them; yet their armies never intermingle, although moving in the same woods and often crossing each other's tracks. The two classes of workers look, at first sight, quite distinct, on account of the wonderful amount of difference between the largest individuals of the one, and the smallest of the other. There are dwarfs not more than one-fifth of an inch in length, with small heads and jaws, and giants half an inch in length with monstrously enlarged head and jaws, all belonging to

the same family. There is not, however, a distinct separation of classes, individuals existing which connect together the two extremes. These Ecitons are seen in the pathways of the forest at all places on the banks of the Amazons, travelling in dense columns of countless thousands. One or other of them is sure to be met with in a woodland ramble, and it is to them probably, that the stories we read in books on South America apply, of ants clearing houses of vermin, although I heard of no instance of their entering houses, their ravages being confined to the thickest parts of the forest.

When the pedestrian falls in with a train of these ants, the first signal given him is a twittering and restless movement of small flocks of plain-coloured birds (ant-thrushes) in the jungle. If this be disregarded until he advances a few steps further, he is sure to fall into trouble, and find himself suddenly attacked by numbers of the ferocious little creatures. They swarm up his legs with incredible rapidity, each one driving its pincer-like jaws into his skin, and with the purchase thus obtained, doubling in its tail, and stinging with all its might. There is no course left but to run for it; if he is accompanied by natives they will be sure to give the alarm, crying "Tauóca!" and scampering at full speed to the other end of the column of ants. The tenacious insects who have secured themselves to his legs then have to be plucked off one by one, a task which is generally not accomplished without pulling them in twain, and leaving heads and jaws sticking in the wounds.

The errand of the vast ant-armies is plunder, as in the case of Eciton legionis; but from their moving always amongst dense thickets, their proceedings are not so easy to observe as in that species. Wherever they move, the whole animal world is set in commotion, and every creature tries to get out of their way. But it is especially the various tribes of wingless insects that have cause for fear, such as heavy-bodied spiders, ants of other species, maggots, caterpillars, larvæ of cockroaches and so forth, all of which live under fallen leaves, or in decaying wood. The Ecitons do not mount very high on trees, and therefore the nestlings of birds are not much incommoded by them. The mode of operation of these armies, which I ascertained only after long-continued observation, is as follows. The main column, from four to six deep, moves forward in a given direction, clearing the ground of all animal matter dead or alive, and throwing off here and there, a thinner column to forage for a short time on the flanks of the main army, and re-enter it again after their task is accomplished. If some very rich place be encountered anywhere near the line of march, for example, a mass of rotten wood abounding in insect larvæ, a delay takes place, and a very strong force of ants is concentrated upon it. The excited creatures search every cranny and tear in pieces all the large grubs they drag to light. It is curious to see them attack wasps' nests, which are sometimes built on low shrubs. They gnaw away the papery covering to get at the larvæ, pupæ, and newly-hatched wasps, and cut everything to tatters, regardless of the infuriated owners which are

flying about them. In bearing off their spoil in fragments, the pieces are apportioned to the carriers with some degree of regard to fairness of load: the dwarfs taking the smallest pieces, and the strongest fellows with small heads the heaviest portions. Sometimes two ants join together in carrying one piece, but the worker-majors with their unwieldy and distorted jaws, are incapacitated from taking any part in the labour. The armies never march far on a beaten path, but seem to prefer the entangled thickets where it is seldom possible to follow them. I have traced an army sometimes for half a mile or more, but was never able to find one that had finished its day's course and returned to its hive. Indeed, I never met with a hive; whenever the Ecitons were seen, they were always on the march.

I thought one day, at Villa Nova, that I had come upon a migratory horde of this indefatigable ant. The place was a tract of open ground near the river side, just outside the edge of the forest, and surrounded by rocks and shrubbery. A dense column of Ecitons was seen extending from the rocks on one side of the little haven, traversing the open space, and ascending the opposite declivity. The length of the procession was from sixty to seventy yards, and yet neither van nor rear was visible. All were moving in one and the same direction, except a few individuals on the outside of the column, which were running rearward, trotting along for a short distance, and then turning again to follow the same course as the main body. But these rearward movements were going on continually from one end to the other of the line, and there was every appearance of their being a

means of keeping up a common understanding amongst all the members of the army, for the retrograding ants stopped very often for a moment to touch one or other of their ownward-moving comrades with their antennæ; a proceeding which has been noticed in other ants, and supposed to be their mode of conveying intelligence. When I interfered with the column or abstracted an individual from it, news of the disturbance was very quickly communicated to a distance of several yards towards the rear, and the column at that point commenced retreating. All the small-headed workers carried in their jaws a little cluster of white maggots, which I thought, at the time, might be young larvæ of their own colony, but afterwards found reason to conclude were the grubs of some other species whose nests they had been plundering, the procession being most likely not a migration, but a column on a marauding expedition.

The position of the large-headed individuals in the marching column was rather curious. There was one of these extraordinary fellows to about a score of the smaller class; none of them carried anything in their mouths, but all trotted along empty-handed and outside the column, at pretty regular intervals from each other, like subaltern officers in a marching regiment of soldiers. It was easy to be tolerably exact in this observation, for their shining white heads made them very conspicuous amongst the rest, bobbing up and down as the column passed over the inequalities of the road. I did not see them change their position, or take any notice of their small-headed comrades marching

in the column, and when I disturbed the line, they did not prance forth or show fight so eagerly as the others. These large-headed members of the community have been considered by some authors as a soldier class, like the similarly-armed caste in Termites; but I found no proof of this, at least in the present species, as they always seemed to be rather less pugnacious than the worker-minors, and their distorted jaws disabled them from fastening on a plane surface like the skin of an attacking animal. I am inclined, however, to think that they may act, in a less direct way, as protectors of the community, namely, as indigestible morsels to the flocks of ant-thrushes which follow the marching columns of these Ecitons, and are the most formidable enemies of the species. It is possible that the hooked and twisted jaws of the large-headed class may be effective weapons of annoyance when in the gizzards or stomachs of these birds, but I unfortunately omitted to ascertain whether this was really the fact.

The life of these Ecitons is not all work, for I frequently saw them very leisurely employed in a way that looked like recreation. When this happened, the place was always a sunny nook in the forest. The main column of the army and the branch columns, at these times, were in their ordinary relative positions; but, instead of pressing forward eagerly, and plundering right and left, they seemed to have been all smitten with a sudden fit of laziness. Some were walking slowly about, others were brushing their antennæ with their fore-feet; but the drollest sight was their cleaning one another. Here and there an ant was seen stretch-

ing forth first one leg and then another, to be brushed or washed by one or more of its comrades, who performed the task by passing the limb between the jaws and the tongue, finishing by giving the antennæ a friendly wipe. It was a curious spectacle, and one well calculated to increase one's amazement at the similarity between the instinctive actions of ants and the acts of rational beings, a similarity which must have been brought about by two different processes of development of the primary qualities of mind. The actions of these ants looked like simple indulgence in idle amusement. Have these little creatures, then, an excess of energy beyond what is required for labours absolutely necessary to the welfare of their species, and do they thus expend it in mere sportiveness, like young lambs or kittens, or in idle whims like rational beings? It is probable that these hours of relaxation and cleaning may be indispensable to the effective performance of their harder labours, but whilst looking at them, the conclusion that the ants were engaged merely in play was irresistible.

*Eciton prædator.*—This is a small dark-reddish species, very similar to the common red stinging-ant of England. It differs from all other Ecitons in its habit of hunting, not in columns, but in dense phalanxes consisting of myriads of individuals, and was first met with at Ega, where it is very common. Nothing in insect movements is more striking than the rapid march of these large and compact bodies. Wherever they pass all the rest of the animal world is thrown into a state of alarm. They stream along the ground and climb to

the summits of all the lower trees, searching every leaf to its apex, and whenever they encounter a mass of decaying vegetable matter, where booty is plentiful, they concentrate, like other Ecitons, all their forces upon it, the dense phalanx of shining and quickly-moving bodies, as it spreads over the surface, looking like a flood of dark-red liquid. They soon penetrate every part of the confused heap, and then, gathering together again in marching order, onward they move. All soft-bodied and inactive insects fall an easy prey to them, and, like other Ecitons, they tear their victims in pieces for facility of carriage. A phalanx of this species, when passing over a tract of smooth ground, occupies a space of from four to six square yards; on examining the ants closely they are seen to move, not altogether in one straightforward direction, but in variously-spreading contiguous columns, now separating a little from the general mass, now re-uniting with it. The margins of the phalanx spread out at times like a cloud of skirmishers from the flanks of an army. I was never able to find the hive of this species.

*Blind Ecitons.*—I will now give a short account of the blind species of Eciton. None of the foregoing kinds have eyes of the facetted or compound structure such as are usual in insects, and which ordinary ants (Formica) are furnished with, but all are provided with organs of vision composed each of a single lens. Connecting them with the utterly blind species of the genus, is a very stout-limbed Eciton, the E. crassicornis, whose eyes are sunk in rather deep sockets. This ant goes on foraging expeditions like the rest of its tribe, and

attacks even the nests of other stinging species (Myrmica), but it avoids the light, moving always in concealment under leaves and fallen branches. When its columns have to cross a cleared space, the ants construct a temporary covered way with granules of earth, arched over, and holding together mechanically; under this the procession passes in secret, the indefatigable creatures repairing their arcade as fast as breaches are made in it.

Next in order comes the Eciton vastator, which has no eyes, although the collapsed sockets are plainly

Foraging ants (Eciton erratica) constructing a covered road—Soldiers sallying out on being disturbed.

visible; and, lastly, the Eciton erratica, in which both sockets and eyes have disappeared, leaving only a faint ring to mark the place where they are usually situated. The armies of E. vastator and E. erratica move, as far as I could learn, wholly under covered roads, the ants constructing them gradually but rapidly as they advance. The column of foragers pushes forward step

by step, under the protection of these covered passages, through the thickets, and on reaching a rotting log, or other promising hunting-ground, pour into the crevices in search of booty. I have traced their arcades, occasionally, for a distance of one or two hundred yards; the grains of earth are taken from the soil over which the column is passing, and are fitted together without cement. It is this last-mentioned feature that distinguishes them from the similar covered roads made by Termites, who use their glutinous saliva to cement the grains together. The blind Ecitons, working in numbers, build up simultaneously the sides of their convex arcades, and contrive, in a surprising manner, to approximate them and fit in the key-stones without letting the loose uncemented structure fall to pieces. There was a very clear division of labour between the two classes of neuters in these blind species. The large-headed class, although not possessing monstrously-lengthened jaws like the worker-majors in E. hamata and E. drepanophora, are rigidly defined in structure from the small-headed class, and act as soldiers, defending the working community (like soldier Termites) against all comers. Whenever I made a breach in one of their covered ways, all the ants underneath were set in commotion, but the worker-minors remained behind to repair the damage, whilst the large-heads issued forth in a most menacing manner, rearing their heads and snapping their jaws with an expression of the fiercest rage and defiance.

The armies of all Ecitons are accompanied by small swarms of a kind of two-winged fly, the females of

which have a very long ovipositor, and which belongs to the genus Stylogaster (family Conopsidæ). These swarms hover with rapidly-vibrating wings, at a height of a foot or less from the soil over which the Ecitons are moving, and occasionally one of the flies darts with great quickness towards the ground. I found they were not occupied in transfixing ants, although they have a long needle-shaped proboscis, which suggests that conclusion, but most probably in depositing their eggs in the soft bodies of insects, which the ants were driving away from their hiding-places. These eggs would hatch after the ants had placed their booty in their hive as food for their young. If this supposition be correct, the Stylogaster would offer a case of parasitism of quite a novel kind. Flies of the genus Tachinus exhibit a similar instinct, for they lie in wait near the entrances to bees' nests, and slip their eggs into the food which the deluded bees are in the act of conveying for their young.

## CHAPTER VI.

### EXCURSIONS BEYOND EGA.

Steamboat travelling on the Amazons—Passengers—Tunantins—Caishána Indians—The Jutahí—Indian tribes on the Jutahí and the Jurúa—The Sapó—Marauá Indians—Fonte Boa—Journey to St. Paulo—Tucúna Indians—Illness—Descent to Pará—Changes at Pará—Departure for England.

*November 7th*, 1856.—Embarked on the Upper Amazons steamer, the "Tabatinga," for an excursion to Tunantins, a small semi-Indian settlement, lying 240 miles beyond Ega. The Tabatinga is an iron boat of about 170 tons burthen, built at Rio de Janeiro, and fitted with engines of fifty horse power. The saloon, with berths on each side for twenty passengers, is above deck, and open at both ends to admit a free current of air. The captain, or "commandante," was a lieutenant in the Brazilian navy, a man of polished, sailor-like address, and a rigid disciplinarian; his name, Senhor Nunes Mello Cardozo. I was obliged, as usual, to take with me a stock of all articles of food, except meat and fish, for the time I intended to be absent (three months); and the luggage, including hammocks, cooking utensils, crockery, and so forth, formed fifteen large packages. One volume consisted of a mosquito tent, an

article I had not yet had occasion to use on the river, but which was indispensable in all excursions beyond Ega, every person, man woman and child, requiring one, as without it existence would be scarcely possible. My tent was about eight feet long and five feet broad, and was made of coarse calico in an oblong shape, with sleeves at each end through which to pass the cords of a hammock. Under this shelter, which is fixed up every evening before sundown, one can read and write, or swing in one's hammock during the long hours which intervene before bed-time, and feel one's sense of comfort increased by having cheated the thirsty swarms of mosquitoes which fill the chamber.

We were four days on the road. The pilot, a mameluco of Ega, whom I knew very well, exhibited a knowledge of the river and powers of endurance which were quite remarkable. He stood all this time at his post, with the exception of three or four hours in the middle of each day, when he was relieved by a young man who served as apprentice, and he knew the breadth and windings of the channel, and the extent of all the yearly-shifting shoals from the Rio Negro to Loreto, a distance of more than a thousand miles. There was no slackening of speed at night, except during the brief but violent storms which occasionally broke upon us, and then the engines were stopped by the command of Lieutenant Nunes, sometimes against the wish of the pilot. The nights were often so dark that we passengers on the poop deck could not discern the hardy fellow on the bridge, but the steamer drove on at full speed, men being stationed on the look-out at the prow,

to watch for floating logs, and one man placed to pass orders to the helmsman; the keel scraped against a sand-bank only once during the passage.

The passengers were chiefly Peruvians, mostly thin, anxious, Yankee-looking men, who were returning home to the cities of Moyobamba and Chachapoyas, on the Andes, after a trading trip to the Brazilian towns on the Atlantic sea-board, whither they had gone six months previously, with cargoes of Panamá hats to exchange for European wares. These hats are made of the young leaflets of a palm-tree, by the Indians and half-caste people who inhabit the eastern parts of Peru. They form almost the only article of export from Peru by way of the Amazons, but the money value is very great compared with the bulk of the goods, as the hats are generally of very fine quality, and cost from twelve shillings to six pounds sterling each; some traders bring down two or three thousand pounds' worth, folded into small compass in their trunks. The return cargoes consist of hardware, crockery, glass, and other bulky or heavy goods, but not of cloth, which, being of light weight, can be carried across the Andes from the ports on the Pacific to the eastern parts of Peru. All kinds of European cloth can be obtained at a much cheaper rate by this route than by the more direct way of the Amazons, the import duties of Peru being, as I was told, lower than those of Brazil, and the difference not being counter-balanced by increased expense of transit, on account of weight, over the passes of the Andes.

There was a great lack of amusement on board. The

table was very well served, professed cooks being employed in these Amazonian steamers, and fresh meat insured by keeping on deck a supply of live bullocks and fowls, which are purchased whenever there is an opportunity on the road. The river scenery was similar to that already described as presented between the Rio Negro and Ega: long reaches of similar aspect, with two long, low lines of forest, varied sometimes with cliffs of red clay, appearing one after the other ; an horizon of water and sky on some days limiting the view both up stream and down. We travelled, however, always near the bank, and, for my part, I was never weary of admiring the picturesque grouping and variety of trees, and the varied mantles of creeping plants which clothed the green wall of forest every step of the way. With the exception of a small village called Fonte Boa, retired from the main river, where we stopped to take in firewood, and which I shall have to speak of presently, we saw no human habitation the whole of the distance. The mornings were delightfully cool ; coffee was served at sunrise, and a bountiful breakfast at ten o'clock ; after that hour the heat rapidly increased until it became almost unbearable ; how the engine-drivers and firemen stood it without exhaustion I cannot tell ; it diminished after four o'clock in the afternoon, about which time dinner-bell rung, and the evenings were always pleasant.

A few miles below Tunantins, and to the west of the most westerly mouth of the Japurá, on the same side of the Solimoens, I saw, to my surprise, a bed of stratified rock, apparently a fine-grained sandstone, exposed on the banks of the river. It was elevated not more

than three or four feet above the present level of the river, which was now, the season having been an unusually wet one, about half full. I had not seen rocks of any kind on the river banks since leaving Manacapurú, 450 miles distant, and this bed seems to have escaped the notice of Spix and Poeppig. The bank, at the foot of which alone the rock was visible, was connected with a tract of land lying higher than the purely alluvial district that extends eastward to a distance of several hundred miles, and was clothed with the rounded, dark-green forest which is distinctive of the *terra firmas* of the Amazons valley. The slightly elevated land continues, with scarcely a break, to the mouth of the Tunantins, which we entered, after making a long circuit to avoid a shoal, on the 11th of November.

*November 11th to 30th.*—The Tunantins is a sluggish black-water stream, about sixty miles in length, and towards its mouth from 100 to 200 yards in breadth. The vegetation on its banks has a similar aspect to that of the Rio Negro, the trees having small foliage of a sombre hue, and the dark piles of greenery resting on the surface of the inky water. The village is situated on the left bank, about a mile from the mouth of the river, and contains twenty habitations, nearly all of which are merely hovels, built of lath-work and mud. The short streets, after rain, are almost impassable, on account of the many puddles, and are choked up with weeds,—leguminous shrubs, and scarlet-flowered asclepias. The atmosphere in such a place, hedged in as it is by the lofty forest, and surrounded by swamps, is always

close, warm, and reeking; and the hum and chirp of insects and birds cause a continual din. The small patch of weedy ground around the village swarms with plovers, sandpipers, striped herons, and scissor-tailed fly-catchers; and alligators are always seen floating lazily on the surface of the river in front of the houses.

On landing, I presented myself to Senhor Paulo Bitancourt, a good-natured half-caste, director of Indians of the neighbouring river Issá, who quickly ordered a small house to be cleared for me. This exhilarating abode contained only one room, the walls of which were disfigured by large and ugly patches of mud, the work of white ants. The floor was the bare earth, dirty and damp; the wretched chamber was darkened by a sheet of calico being stretched over the windows, a plan adopted here to keep out the Pium-flies, which float about in all shady places like thin clouds of smoke, rendering all repose impossible in the daytime wherever they can effect an entrance. My baggage was soon landed, and before the steamer departed I had taken gun, insect-net, and game-bag, to make a preliminary exploration of my new locality.

I remained here nineteen days, and, considering the shortness of the time, made a very good collection of monkeys, birds, and insects. A considerable number of the species (especially of insects) were different from those of the four other stations, which I examined on the south side of the Solimoens, and as many of these were "representative forms"* of others found on the opposite banks of the broad river, I concluded that

* Species or races which take the place of other allied species or races.

there could have been no land connection between the two shores during, at least, the recent geological period. This conclusion is confirmed by the case of the Uakarí monkeys, described in the last chapter. All these strongly modified local races of insects confined to one side of the Solimoens (like the Uakarís), are such as have not been able to cross a wide treeless space such as a river. The acquisition which pleased me most, in this place, was a new species of butterfly (a Catagramma), which has since been named C. excelsior, owing to its surpassing in size and beauty all the previously-known species of its singularly beautiful genus. The upper surface of the wings is of the richest blue, varying in shade with the play of light, and on each side is a broad curved stripe of an orange colour. It is a bold flyer, and is not confined, as I afterwards found, to the northern side of the river, for I once saw a specimen amidst a number of richly-coloured butterflies, flying about the deck of the steamer when we were anchored off Fonte Boa, 200 miles lower down the river.

With the exception of three mameluco families and a stray Portuguese trader, all the inhabitants of the village and neighbourhood are semi-civilised Indians of the Shumána and Passé tribes. The forests of the Tunantins, however, are inhabited by a tribe of wild Indians called Caishánas, who resemble much, in their social condition and manners, the debased Múras of the Lower Amazons, and have, like them, shown no aptitude for civilised life in any shape. Their huts commence at the distance of an hour's walk from the village, along gloomy and narrow forest-paths. The

territory of the tribe extends to the Moco, an affluent of the Japurá, with which there is communication by land higher up the Tunantins, the two rivers approximating within about fifteen miles. From what I saw nd heard of the Caishánas, I was led to the conclusion that they had no close genealogical relationship with the Múras, but were more likely a degraded section of the Shumána, or some other neighbouring tribe. Scarcely any of them had the coarse features, the large trunk, broad chest, thick arms, and protuberant abdomen of the Múras, and their features, although presenting a wild, unsteady, and distrustful expression like the Múras, were often as finely shaped as those of the Shumánas and Passés. Senhor Bitancourt told me their "girio," or tribal language, had much resemblance to that of the Shumánas. I have before shown how scattered hordes have segregrated from their original tribes, and by long isolation, themselves become tribes, acquiring totally different languages, habits, and, to a lesser extent, different corporeal structure.

My first and only visit to a Caishána dwelling, was accidental. One day, having extended my walk further than usual, and followed one of the forest-roads until it became a mere *picada*, or hunters' track, I came suddenly upon a well-trodden pathway, bordered on each side with Lycopodia of the most elegant shapes, the tips of the fronds stretching almost like tendrils down the little earthy slopes which formed the edge of the path. The road, though smooth, was narrow and dark, and in many places blocked up by trunks of felled trees, which had been apparently thrown across by the timid Indians

on purpose to obstruct the way to their habitations. Half-a-mile of this shady road brought me to a small open space on the banks of a brook or creek, on the skirts of which stood a conical hut with a very low doorway. There was also an open shed, with stages made of split palm-stems, and a number of large wooden troughs. Two or three dark-skinned children, with a man and woman, were in the shed; but, immediately on espying me, all of them ran to the hut, bolting through the little doorway like so many wild animals scared into their burrows. A few moments after, the man put his head out with a look of great distrust; but, on my making the most friendly gestures I could think of, he came forth with the children. They were all smeared with black mud and paint; the only clothing of the elders was a kind of apron made of the inner bark of the sapucaya-tree, and the savage aspect of the man was heightened by his hair hanging over his forehead to the eyes. I stayed about two hours in the neighbourhood, the children gaining sufficient confidence to come and help me to search for insects. The only weapon used by the Caishánas is the blow-pipe, and this is employed only in shooting animals for food. They are not a warlike people, like most of the neighbouring tribes on the Japurá and Issá. Their utensils consist of earthenware cooking-vessels, wooden stools, drinking-cups of gourds, and the usual apparatus for making farinha, of which they produce a considerable quantity, selling the surplus to traders at Tunantins.

The whole tribe of Caishánas does not exceed in number 400 souls. None of them are baptised Indians,

and they do not dwell in villages, like the more advanced sections of the Tupí stock; but each family has its own solitary hut. They are quite harmless, do not practise tattooing, or perforate their ears and noses in any way. Their social condition is of a low type, very little removed, indeed, from that of the brutes living in the same forests. They do not appear to obey any common chief, and I could not make out that they had Pajés, or medicine-men, those rudest beginnings of a priest class. Symbolical or masked dances, and ceremonies in honour of the Jurupari, or demon, customs which prevail amongst all the surrounding tribes, are unknown to the Caishánas. There is amongst them a trace of festival-keeping; but the only ceremony used is the drinking of cashirí beer, and fermented liquors made of Indian-corn, bananas, and so forth. These affairs, however, are conducted in a degenerate style, for they do not drink to intoxication, or sustain the orgies for several days and nights in succession, like the Jurís, Passés, and Tucúnas. The men play a musical instrument, made of pieces of stem of the arrow-grass cut in different lengths and arranged like pan-pipes. With this they while away whole hours, lolling in ragged bast hammocks slung in their dark, smoky huts. The Tunantins people say that the Caishánas have persecuted the wild animals and birds to such an extent near their settlements that there is now quite a scarcity of animal food. If they kill a Toucan, it is considered an important event, and the bird is made to serve as a meal for a score or more persons. They boil the meat in earthenware kettles filled with Tucupí sauce, and eat it with

beiju, or mandioca-cakes. The women are not allowed to taste of the meat, but forced to content themselves with sopping pieces of cake in the liquor.

I obtained a little information here concerning the inhabitants of the banks of the Issá, a stream 700 miles in length, which, having its sources at the foot of the volcanoes near Pasto, in New Granada, enters the Amazons about twenty miles to the west of Tunantins. I once met a mulatto of Pasto and his wife, who had descended this river from its source to its mouth. They lost all their luggage in passing the cataracts; but found, after the first fifteen days of their journey (about 150 miles), no more obstructions to navigation down to the Solimoens. It is not so unhealthy a river as the Japurá; but the natives are much less friendly to the whites than those inhabiting that river. To the distance of about 400 miles from Tunantins, its banks are now almost destitute of inhabitants. A few half-civilised and peaceable Passés, Jurís, and Shumánas, are settled near its mouth; but higher up the Marietés occupy the domain, and towards the frontiers of New Granada, Miránhas are the only Indians met with, whose territory extends overland thence to the Japurá. The Marietés and Miránhas have been for many years constantly at war, and the depopulation of the country is owing partly to this circumstance, and partly to diseases introduced by the whites. These wars are not carried on by the whole of each tribe at once, but in a series of partial hostilities between separate hordes or clans. The hordes of each nation live apart; indeed these tribes have no villages, but are scattered in families

over the country, and are connected together by no other ties than a common name and the tradition of general enmity towards the hordes bearing the name of the other nation. Moreover, hordes belonging to the same tribe or nation sometimes quarrel with each other. These petty wars originate in this fashion: a member of a family falls ill, and his or her relations, or the rest of the horde, get hold of the idea that the Pajé of a neighbouring horde has caused the illness by witchcraft; all then assemble for a grand drinking-bout, during which they excite each other by reciting their wrongs. The armed men meet on the following day, and march by intricate paths or circuitous streams, so as to take their enemies by surprise, and then pounce upon them with loud shouts, killing all they can, and burning their huts to the ground.

*November 30th.*—I left Tunantins in a trading schooner of eighty tons burthen belonging to Senhor Batalha, a tradesman of Ega, which had been out all the summer collecting produce, and was commanded by a friend of mine, a young Paraense, named Francisco Raiol. We arrived, on the 3rd of December, at the mouth of the Jutahí, a considerable stream about half a mile broad, and flowing with a very sluggish current. This is one of a series of six rivers, from 400 to 1000 miles in length, which flow from the south-west through unknown lands lying between Bolivia and the Upper Amazons, and enter this latter river between the Madeira and the Ucayáli. The sources of none of them are known. The longest of the six is the

Purús, the first met with in ascending the Solimoens. I gleaned very little information concerning the Jutahí, which was not visited much by traders, but, as far as I could learn, its banks were peopled by nearly the same wild tribes as those of the next parallel stream, the Juruá, about which I gathered a good deal from my friend John da Cunha, who ascended it as far as it was navigable on a trading expedition. The Juruá flows wholly through a flat country covered with light-green forests, and its waters are tinged ochreous, by the quantity of clayey and earthy matter held in suspension, like those of the Solimoens. At the end of the navigation there is a road by land to the Purús, the two great streams being there only about thirty or forty miles distant from each other. The Jutahí must be a much shorter river than the Juruá, for, as Senhor Cunha told me, the Conibos, an advanced tribe of agricultural Indians living on the banks of the Juruá near its source, have at that point a direct road by land to the Ucayáli, which must pass to the south of the sources both of the Jutahí and Jauarí, the two rivers lying between the Juruá and Ucayáli. Eight distinct tribes of Indians inhabit the banks of the Juruá, all of which, except the most remote (the Conibos) pass overland to the Jutahí.* Each tribe has its peculiar language, and to a great extent, also its peculiar customs. I heard, however, of no new feature in Indian character or customs, except

* The order in which they are met with on ascending the river is as follows :—1. Marauás.—2. Catauishís.—3. Canamarés.—4. Araúas.—5. Collinas (rivers Shiruán and Invíra, affluents of the right bank).—6. Catoquínos (R. Shiruán).—7. Naüas.—8. Conibos, with their hordes Mauishís, Zaminaüas, and true Conibos.

that the Conibos practise the art of knitting cotton cloth, which they fashion into long cloaks. The cloth, of which I saw many specimens, forms a regular, durable, and not inelegant web of tolerably close texture. The Conibos, like the Indians of Peru, do not grow the poisonous kind of mandioca, but simply the sweet kind, or Macasheira (Manihot Aypi). I estimate the length of the Jutahí at about 400 miles, and that of the Juruá at 600 miles.

We remained at anchor four days within the mouth of the Sapó, a small tributary of the Jutahí flowing from the south-east ; Senhor Raiol having to send an igarité to the Cupatána, a large tributary some few miles further up the river, to fetch a cargo of salt fish. During this time we made several excursions in the montaria to various places in the neighbourhood. Our longest trip was to some Indian houses, a distance of fifteen or eighteen miles up the Sapó, a journey made with one Indian paddler, and occupying a whole day. The stream is not more than forty or fifty yards broad ; its waters are darker in colour than those of the Jutahí, and flow, as in all these small rivers, partly under shade between two lofty walls of forest. We passed, in ascending, seven habitations, most of them hidden in the luxuriant foliage of the banks ; their sites being known only by small openings in the compact wall of forest, and the presence of a canoe or two tied up in little shady ports. The inhabitants are chiefly Indians of the Marauá tribe, whose original territory comprised all the small by-streams lying between the Jutahí and the Juruá, near the mouths of both these great tribu-

taries. They live in separate families or small hordes ; have no common chief, and are considered as a tribe little disposed to adopt civilised customs or be friendly with the whites. One of the houses belonged to a Jurí family, and we saw the owner, an erect, noble-looking old fellow, tattooed, as customary with his tribe, in a large patch over the middle of his face, fishing under the shade of a colossal tree in his port with hook and line. He saluted us in the usual grave and courteous manner of the better sort of Indians as we passed by.

We reached the last house, or rather two houses, about ten o'clock, and spent there several hours during the great heat of mid-day. The houses, which stood on a high clayey bank, were of quadrangular shape, partly open like sheds, and partly enclosed with rude mud-walls, forming one or more chambers. The inhabitants, a few families of Marauás, comprising about thirty persons, received us in a frank, smiling manner : a reception which may have been due to Senhor Raiol being an old acquaintance and somewhat of a favourite. None of them were tattooed ; but the men had great holes pierced in their ear-lobes, in which they insert plugs of wood, and their lips were drilled with smaller holes. One of the younger men, a fine strapping fellow nearly six feet high, with a large aquiline nose, who seemed to wish to be particularly friendly with me, showed me the use of these lip-holes, by fixing a number of little white sticks in them, and then twisting his mouth about and going through a pantomime to represent defiance in the presence of an enemy. Nearly all the people were disfigured by dark blotches on the

skin, the effect of a cutaneous disease very prevalent in this part of the country. The face of one old man was completly blackened, and looked as though it had been smeared with black lead, the blotches having coalesced to form one large patch. Others were simply mottled; the black spots were hard and rough, but not scaly, and were margined with rings of a colour paler than the natural hue of the skin. I had seen many Indians and a few half-castes at Tunantins, and afterwards saw others at Fonte Boa blotched in the same way. The disease would seem to be contagious, for I was told that a Portuguese trader became disfigured with it after cohabiting some years with an Indian woman. It is curious that, although prevalent in many places on the Solimoens, no resident of Ega exhibited signs of the disease: the early explorers of the country, on noticing spotted skins to be very frequent in certain localities, thought they were peculiar to a few tribes of Indians. The younger children in these houses on the Sapó were free from spots; but two or three of them, about ten years of age, showed signs of their commencement in rounded yellowish patches on the skin, and these appeared languid and sickly, although the blotched adults seemed not to be affected in their general health. A middle-aged half-caste at Fonte Boa told me he had cured himself of the disorder by strong doses of salsaparilla; the black patches had caused the hair of his beard and eyebrows to fall off, but it had grown again since his cure.

When my tall friend saw me, after dinner, collecting insects along the paths near the houses, he approached,

and, taking me by the arm, led me to a mandioca shed, making signs, as he could speak very little Tupí, that he had something to show. I was not a little surprised when, having mounted the girao, or stage of split palm-stems, and taken down an object transfixed to a post, he exhibited, with an air of great mystery, a large chrysalis suspended from a leaf, which he placed carefully in my hands, saying, "Pána-paná curí" (Tupí: butterfly by-and-by). Thus I found that the metamorphoses of insects were known to these savages; but being unable to talk with my new friend, I could not ascertain what ideas such a phenomenon had given rise to in his mind. The good fellow did not leave my side during the remainder of our stay; but, thinking apparently that I had come here for information, he put himself to considerable trouble to give me all he could. He made a quantity of Hypadú powder, that I might see the process; going about the task with much action and ceremony, as though he were a conjuror performing some wonderful trick.

We left these friendly people about four o'clock in the afternoon, and in descending the umbrageous river, stopped, about half-way down, at another house built in one of the most charming situations I had yet seen in this country. A clean, narrow, sandy pathway led from the shady port to the house, through a tract of forest of indescribable luxuriance. The buildings stood on an eminence in the middle of a level cleared space; the firm sandy soil, smooth as a floor, forming a broad terrace around them. The owner was a semi-civilised Indian, named Manoel; a dull, taciturn fellow, who, together

with his wife and children, seemed by no means pleased at being intruded on in their solitude. The family must have been very industrious; for the plantations were very extensive, and included a little of almost all kinds of cultivated tropical productions: fruit trees, vegetables, and even flowers for ornament. The silent old man had surely a fine appreciation of the beauties of nature: for the site he had chosen commanded a view of surprising magnificence over the summits of the forest; and, to give finish to the prospect, he had planted a large quantity of banana trees in the foreground, thus concealing the charred and dead stumps which would otherwise have marred the effect of the rolling sea of greenery. The only information I could get out of Manoel was, that large flocks of richly-coloured birds came down in the fruit season and despoiled his trees. I collected here a great number of insects, including several new species. The sun set over the tree-tops before we left this little Eden, and the remainder of our journey was made slowly and pleasantly, under the chequered shades of the river banks, by the light of the moon.

*December 7th.*—Arrived at Fonte Boa; a wretched, muddy, and dilapidated village, situated two or three miles within the mouth of a narrow by-stream called the Cayhiar-hy, which runs almost as straight as an artificial canal between the village and the main Amazons. The character of the vegetation and soil here was different from that of all other localities I had hitherto examined; I had planned, therefore, to devote six weeks to the place. Having written beforehand to one

of the principal inhabitants, Senhor Venancio, a house was ready for me on landing. The only recommendation of the dwelling was its coolness. It was, in fact, rather damp; the plastered walls bore a crop of green mould, and a slimy moisture oozed through the black, dirty floor; the rooms were large, but lighted by miserable little holes in place of windows. The village is built on a clayey plateau, and the ruinous houses are arranged round a large square, which is so choked up with tangled bushes that it is quite impassable, the lazy inhabitants having allowed the fine open space to relapse into jungle. The stiff clayey eminence is worn into deep gullies which slope towards the river, and the ascent from the port in rainy weather is so slippery that one is obliged to crawl up to the streets on all fours. A large tract of ground behind the place is clear of forest, but this, as well as the streets and gardens, is covered with a dense, tough carpet of shrubs, having the same wiry nature as our common heath. Beneath its deceitful covering the soil is always moist and soft, and in the wet season the whole is converted into a glutinous mud swamp. There is a very pretty church in one corner of the square, but in the rainy months of the year (nine out of the twelve) the place of worship is almost inaccessible to the inhabitants on account of the mud, the only means of getting to it being by hugging closely the walls and palings, and so advancing sideways step by step.

I remained in this delectable place until the 25th of January, 1857. Fonte Boa, in addition to its other amenities, has the reputation throughout the country of

being the head-quarters of mosquitoes, and it fully deserves the title. They are more annoying in the houses by day than by night, for they swarm in the dark and damp rooms, keeping, in the daytime, near the floor, and settling by half-dozens together, on the legs. At night the calico tent is a sufficient protection; but this is obliged to be folded every morning, and in letting it down before sunset, great care is required to prevent any of the tormentors from stealing in beneath, their insatiable thirst for blood, and pungent sting, making these enough to spoil all comfort. In the forest the plague is much worse; but the forest-mosquito belongs to a different species from that of the town, being much larger, and having transparent wings; it is a little cloud that one carries about one's person every step on a woodland ramble, and their hum is so loud that it prevents one hearing well the notes of birds. The town-mosquito has opaque speckled wings, a less severe sting, and a silent way of going to work; the inhabitants ought to be thankful the big, noisy fellows never come out of the forest. In compensation for the abundance of mosquitoes, Fonte Boa has no piums; there was, therefore, some comfort outside one's door in the daytime; the comfort, however, was lessened by there being scarcely any room in front of the house to sit down or walk about, for, on our side of the square, the causeway was only two feet broad, and to step over the boundary, formed by a line of slippery stems of palms, was to sink up to the knees in a sticky swamp.

Notwithstanding damp and mosquitoes, I had capital health, and enjoyed myself much at Fonte Boa; swampy

and weedy places being generally more healthy than dry ones on the Amazons, probably owing to the absence of great radiation of heat from the ground. The forest was extremely rich and picturesque, although the soil was everywhere clayey and cold, and broad pathways threaded it for many a mile over hill and dale. In every hollow flowed a sparkling brook, with perennial and crystal waters. The margins of these streams were paradises of leafiness and verdure; the most striking feature being the variety of ferns, with immense leaves, some terrestrial, others climbing over trees, and two, at least, arborescent. I saw here some of the largest trees I had yet seen; there was one especially, a cedar, whose colossal trunk towered up for more than a hundred feet, straight as an arrow; I never saw its crown, which was lost to view, from below, beyond the crowd of lesser trees which surrounded it. Birds and monkeys in this glorious forest were very abundant; the bear-like Pithecia hirsuta being the most remarkable of the monkeys, and the Umbrella Chatterer and Curl-crested Toucans amongst the most beautiful of the birds. The Indians and half-castes of the village have made their little plantations, and built huts for summer residence on the banks of the rivulets, and my rambles generally terminated at one or other of these places. The people were always cheerful and friendly, and seemed to be glad when I proposed to join them at their meals, contributing the contents of my provision-bag to the dinner, and squatting down amongst them on the mat.

The village was formerly a place of more importance than it now is, a great number of Indians belonging to

the most industrious tribes, Shumánas, Passés, and Cambévas, having settled on the site and adopted civilised habits, their industry being directed by a few whites, who seem to have been men of humane views as well as enterprising traders. One of these old employers, Senhor Guerreiro, a well-educated Paraense, was still trading on the Amazons when I left the country, in 1859: he told me that forty years previously Fonte Boa was a delightful place to live in. The neighbourhood was then well cleared, and almost free from mosquitoes, and the Indians were orderly, industrious, and happy. What led to the ruin of the settlement was the arrival of several Portuguese and Brazilian traders of a low class, who in their eagerness for business taught the easy-going Indians all kinds of trickery and immorality. They enticed the men and women away from their old employers, and thus broke up the large establishments, compelling the principals to take their capital to other places. At the time of my visit there were few pure-blood Indians at Fonte Boa, and no true whites. The inhabitants seemed to be nearly all mamelucos, and were a loose-living, rustic, plain-spoken and ignorant set of people. There was no priest or schoolmaster within 150 miles, and had not been any for many years: the people seemed to be almost without government of any kind, and yet crime and deeds of violence appeared to be of very rare occurrence. The principal man of the village, one Senhor Justo, was a big, coarse, energetic fellow, sub-delegado of police, and the only tradesman who owned a large vessel running directly between Fonte Boa and Pará. He had recently built a large

house, in the style of middle-class dwellings of towns, namely, with brick floors and tiled roof, the bricks and tiles having been brought from Pará, 1500 miles distant, the nearest place where they are manufactured in surplus. When Senhor Justo visited me he was much struck with the engravings in a file of "Illustrated London News," which lay on my table. It was impossible to resist his urgent entreaties to let him have some of them "to look at," so one day he carried off a portion of the papers on loan. A fortnight afterwards, on going to request him to return them, I found the engravings had been cut out, and stuck all over the newly whitewashed walls of his chamber, many of them upside down. He thought a room thus decorated with foreign views would increase his importance amongst his neighbours, and when I yielded to his wish to keep them, was boundless in demonstrations of gratitude, ending by shipping a boat-load of turtles for my use at Ega.

These neglected and rude villagers still retained many religious practices which former missionaries or priests had taught them. The ceremony which they observed at Christmas, like that described as practised by negroes in a former chapter, was very pleasing for its simplicity, and for the heartiness with which it was conducted. The church was opened, dried, and swept clean a few days before Christmas-eve, and on the morning all the women and children of the village were busy decorating it with festoons of leaves and wild flowers. Towards midnight it was illuminated inside and out with little oil lamps, made of clay, and the image of the "menino Deus," or Child-God, in its cradle,

was placed below the altar, which was lighted up with rows of wax candles, very lean ones, but the best the poor people could afford. All the villagers assembled soon afterwards, dressed in their best, the women with flowers in their hair, and a few simple hymns, totally irrelevant to the occasion, but probably the only ones known by them, were sung kneeling; an old half-caste, with black-spotted face, leading off the tunes. This finished, the congregation rose, and then marched in single file up one side of the church and down the other, singing together a very pretty marching chorus, and each one, on reaching the little image, stooping to kiss the end of a ribbon which was tied round its waist. Considering that the ceremony was got up of their own free-will, and at considerable expense, I thought it spoke well for the good intentions and simplicity of heart of these poor, neglected villagers.

I left Fonte Boa, for Ega, on the 25th of January, making the passage by steamer, down the middle of the current, in sixteen hours. The sight of the clean and neat little town, with its open spaces, close-cropped grass, broad lake, and white sandy shores, had a most exhilarating effect, after my trip into the wilder parts of the country. The district between Ega and Loreto, the first Peruvian village on the river, is, indeed, the most remote, thinly-peopled, and barbarous of the whole line of the Amazons, from ocean to ocean. Beyond Loreto, signs of civilisation, from the side of the Pacific, begin to be numerous, and, from Ega downwards, the improvement is felt from the side of the Atlantic.

*September 5th,* 1857.—Again embarked on the "Tabatinga," this time for a longer excursion than the last, namely to St. Paulo de Olivença, a village higher up than any I had yet visited, being 260 miles distant, in a straight line, from Ega, or about 400 miles following the bends of the river.

The waters were now nearly at their lowest point; but this made no difference to the rate of travelling, night or day. Several of the Paraná mirims, or by-channels, which the steamer threads in the season of full-water, to save a long circuit, were now dried up, their empty beds looking like deep sandy ravines in the midst of the thick forest. The large sand-islands, and miles of sandy beach, were also uncovered, and these, with the swarms of large aquatic birds, storks, herons, ducks, waders, and spoon-bills, which lined their margins in certain places, made the river view much more varied and animated than it is in the season of the flood. Alligators of large size were common near the shores, lazily floating, and heedless of the passing steamer. The passengers amused themselves by shooting at them from the deck with a double-barrelled rifle we had on board. The sign of a mortal hit was the monster turning suddenly over, and remaining floating, with its white belly upwards. Lieutenant Nunes wished to have one of the dead animals on board, for the purpose of opening the abdomen, and, if a male, extracting a part which is held in great estimation amongst Brazilians as a "remedio," charm or medicine. The steamer was stopped, and a boat sent, with four strong men, to embark the beast; the body, however,

was found too heavy to be lifted into the boat; so a rope was passed round it, and the hideous creature towed alongside, and hoisted on deck by means of the crane, which was rigged for the purpose. It had still some sparks of life, and when the knife was applied, lashed its tail, and opened its enormous jaws, sending the crowd of bystanders flying in all directions. A blow with a hatchet on the crown of the head, gave him his quietus at last. The length of the animal was fifteen feet; but this statement can give but an imperfect idea of its immense bulk and weight. The numbers of turtles which were seen swimming in quiet shoaly bays passed on the road, also gave us much amusement. They were seen by dozens ahead, with their snouts peering above the surface of the water; and, on the steamer approaching, turning round to stare, but not losing confidence, till the vessel had nearly passed, when they appeared to be suddenly smitten with distrust, diving like ducks under the stream.

We had on board, amongst our deck-passengers, a middle-aged Indian, of the Jurí tribe; a short, thick-set man, with features resembling much those of the late Daniel O'Connell. His name was Caracára-í (Black Eagle), and his countenance seemed permanently twisted into a grim smile, the effect of which was heightened by the tattooed marks—a blue rim to the mouth, with a diagonal pointed streak from each corner towards the ear. He was dressed in European style—black hat, coat, and trousers—looking very uncomfortable in the dreadful heat which, it is unnecessary to say, exists on board a steamer, under a vertical sun, during

mid-day hours. This Indian was a man of steady resolution, ambitious and enterprising; very rare qualities in the race to which he belonged, weakness of resolution being one of the fundamental defects in the Indian character. He was now on his return home to the banks of the Issá from Pará, whither he had been to sell a large quantity of salsaparilla that he had collected, with the help of a number of Indians, whom he induces, or forces, to work for him. One naturally feels inclined to know what ideas such a favourable specimen of the Indian race may have acquired after so much experience amongst civilised scenes. On conversing with our fellow-passenger, I was greatly disappointed in him; he had seen nothing, and thought of nothing, beyond what concerned his little trading speculation, his mind being, evidently, what it had been before, with regard to all higher subjects or general ideas, a blank. The dull, mean, practical way of thinking of the Amazonian Indians, and the absence of curiosity and speculative thought which seems to be organic or confirmed in their character, although they are improveable to a certain extent, make them, like common-place people everywhere, most uninteresting companions. Caracára-í disembarked at Tunantins with his cargo, which consisted of a considerable number of packages of European wares.

The river scenery about the mouth of the Japurá is extremely grand, and was the subject of remark amongst the passengers. Lieutenant Nunes gave it as his opinion, that there was no diminution of width or grandeur in the mighty stream up to this point, a distance of 1500 miles from the Atlantic; and yet we did

not here see the two shores of the river on both sides at once; lines of islands, or tracts of alluvial land, having by-channels in their rear, intercepting the view of the northern mainland, and sometimes also of the southern. Beyond the Issá, however, the river becomes evidently narrower, being reduced to an average width of about a mile; there were then no longer those magnificent reaches, with blank horizons, which occur lower down. We had a dark and rainy night after passing Tunantins, and the passengers were all very uneasy on account of the speed at which we were travelling, twelve miles an hour, with every plank vibrating with the force of the engines. Many of them could not sleep, myself amongst the number. At length, a little after midnight, a sudden shout startled us; "back her!" (English terms being used in matters relating to steam-engines). The pilot instantly sprung to the helm, and in a few moments we felt our paddle-box brushing against the wall of forest into which we had nearly driven headlong. Fortunately the water was deep close up to the bank. Early in the morning of the 10th of September we anchored in the port of St. Paulo, after five days' quick travelling from Ega.

St. Paulo is built on a high hill, on the southern bank of the river. The hill is formed of the same Tabatinga clay, which occurs at intervals over the whole valley of the Amazons, but nowhere rises to so great an elevation as here, the height being about 100 feet above the mean level of the river. The ascent from the port is steep and slippery; steps and resting-places have been made to lighten the fatigue of mounting,

otherwise the village would be almost inaccessible, especially to porters of luggage and cargo, for there are no means of making a circuitous road of more moderate slope, the hill being steep on all sides, and surrounded by dense forests and swamps. The place contains about 500 inhabitants, chiefly half-castes and Indians of the Tucúna and Collína tribes, who are very little improved from their primitive state. The streets are narrow, and in rainy weather inches deep in mud; many houses are of substantial structure, but in a ruinous condition, and the place altogether presents the appearance, like Fonte Boa, of having seen better days. Signs of commerce, such as meet the eye at Ega, could scarcely be expected in this remote spot, situate 1800 miles, or seven months' round voyage by sailing-vessels, from Pará, the nearest market for produce. A very short experience showed that the inhabitants were utterly debased, the few Portuguese and other immigrants having, instead of promoting industry, adopted the lazy mode of life of the Indians, spiced with the practice of a few strong vices of their own introduction.

The head man of the village, Senhor Antonio Ribeiro, half-white half-Tucúna, prepared a house for me on landing, and introduced me to the principal people. The summit of the hill is grassy table-land, of two or three hundred acres in extent. The soil is not wholly clay, but partly sand and gravel; the village, itself, however, stands chiefly on clay, and the streets therefore, after heavy rains, become filled with muddy puddles. On damp nights, the chorus of frogs and toads which swarm in weedy back-yards, creates such a be-

wildering uproar, that it is impossible to carry on a conversation in-doors except by shouting. My house was damper even than the one I occupied at Fonte Boa, and this made it extremely difficult to keep my collections from being spoilt by mould. But the general humidity of the atmosphere in this part of the river was evidently much greater than it is lower down ; it appears to increase gradually in ascending from the Atlantic to the Andes. It was impossible at St. Paulo to keep salt for many days in a solid state, which was not the case at Ega, when the baskets in which it is contained were well wrapped in leaves. Six degrees further westward, namely, at the foot of the Andes, the dampness of the climate of the Amazonian forest region appears to reach its acme, for Poeppig found at Chinchao that the most refined sugar, in a few days, dissolved into syrup, and the best gunpowder became liquid, even when enclosed in canisters. At St. Paulo, refined sugar kept pretty well in tin boxes, and I had no difficulty in keeping my gunpowder dry in canisters, although a gun loaded over night could very seldom be fired off in the morning.

The principal residents at St. Paulo were the priest, a white from Pará, who spent his days and most of his nights in gambling and rum-drinking, corrupting the young fellows and setting the vilest example to the Indians ; the sub-delegado, an upright, open-hearted, and loyal negro, whom I have before mentioned, Senhor José Patricio ; the Juiz de Paz, a half-caste named Geraldo, and lastly, Senhor Antonio Ribeiro, who was Director of the Indians. Geraldo and Ribeiro were my

near neighbours, but they took offence at me after the first few days, because I would not join them in their drinking bouts, which took place about every third day. They used to begin early in the morning with Cashaça mixed with grated ginger, a powerful drink which used to excite them almost to madness. Neighbour Geraldo, after these morning potations, used to station himself opposite my house and rave about foreigners, gesticulating in a threatening manner towards me, by the hour. After becoming sober in the evening, he usually came to offer me the humblest apologies, driven to it, I believe, by his wife, he himself being quite unconscious of this breach of good manners. The wives of the St. Paulo worthies, however, were generally as bad as their husbands ; nearly all the women being hard drinkers, and corrupt to the last degree. Wife-beating naturally flourished under such a state of things. I found it always best to lock myself in-doors after sunset, and take no notice of the thumps and screams which used to rouse the village in different quarters throughout the night, especially at festival times.

The only companionable man I found in the place, except José Patricio, who was absent most part of the time, was the negro tailor of the village, a tall, thin, grave young man, named Mestre Chico (Master Frank), whose acquaintance I had made at Pará several years previously. He was a free negro by birth, but had had the advantage of kind treatment in his younger days, having been brought up by a humane and sensible man, one Captain Basilio, of Pernambuco, his padrinho, or godfather. He neither drank, smoked, nor gambled,

and was thoroughly disgusted at the depravity of all classes in this wretched little settlement, which he intended to quit as soon as possible. When he visited me at night, he used to knock at my shutters in a manner we had agreed on, it being necessary to guard against admitting drunken neighbours, and we then spent the long evenings most pleasantly, working and conversing. His manners were courteous, and his talk well worth listening to, for the shrewdness and good sense of his remarks. I first met Mestre Chico at the house of an old negress of Pará, Tia Rufina (Aunt Rufina), who used to take charge of my goods when I was absent on a voyage, and this affords me an opportunity of giving a few further instances of the excellent qualities of free negroes in a country where they are not wholly condemned to a degrading position by the pride or hatred of the white race. This old woman was born a slave, but like many others in the large towns of Brazil, she had been allowed to trade on her own account, as market-woman, paying a fixed sum daily to her owner, and keeping for herself all her surplus gains. In a few years she had saved sufficient money to purchase her freedom, and that of her grown-up son. This done, the old lady continued to strive until she had earned enough to buy the house in which she lived, a considerable property situated in one of the principal streets. When I returned from the interior, after seven years' absence from Pará, I found she was still advancing in prosperity, entirely through her own exertions (being a widow) and those of her son, who continued, with the most regular industry, his trade as blacksmith, and

was now building a number of small houses on a piece of unoccupied land attached to her property. I found these and many other free negroes most trustworthy people, and admired the constancy of their friendships and the gentleness and cheerfulness of their manners towards each other. They showed great disinterestedness in their dealings with me, doing me many a piece of service without a hint at remuneration; but this may have been partly due to the name of Englishman, the knowledge of our national generosity towards the African race being spread far and wide amongst the Brazilian negroes.

I remained at St. Paulo five months; five years would not have been sufficient to exhaust the treasures of its neighbourhood in Zoology and Botany. Although now a forest-rambler of ten years' experience, the beautiful forest which surrounds this settlement gave me as much enjoyment as if I had only just landed for the first time in a tropical country. The Zoology revealed plainly the nearer proximity of the locality to the eastern slopes of the Andes than any I had yet visited, by the first appearance of many of the peculiar and richly-coloured forms (especially of insects), which are known only as inhabitants of the warm and moist valleys of New Granada and Peru. The plateau on which the village is built extends on one side nearly a mile into the forest, but on the other side the descent into the lowland begins close to the streets; the hill sloping abruptly towards a boggy meadow surrounded by woods, through which a narrow winding path continues the slope down to a cool shady glen, with a brook of icy-

cold water flowing at the bottom. At midday the vertical sun penetrates into the gloomy depths of this romantic spot, lighting up the leafy banks of the rivulet and its clean sandy margins, where numbers of scarlet, green, and black tanagers and brightly-coloured butterflies sport about in the stray beams. Sparkling brooks, large and small, traverse the glorious forest in almost every direction, and one is constantly meeting, whilst rambling through the thickets, with trickling rills and bubbling springs, so well-provided is the country with moisture. Some of the rivulets flow over a sandy and pebbly bed, and the banks of all are clothed with the most magnificent vegetation conceivable. I had the almost daily habit, in my solitary walks, of resting on the clean banks of these swift-flowing streams, and bathing for an hour at a time in their bracing waters ; hours which now remain amongst my most pleasant memories. The broad forest roads continue, as I was told, a distance of several days' journey into the interior, which is peopled by Tucúnas and other Indians, living in scattered houses and villages nearly in their primitive state, the nearest village lying about six miles from St. Paulo. The banks of all the streams are dotted with palm-thatched dwellings of Tucúnas, all half-buried in the leafy wilderness, the scattered families having chosen the coolest and shadiest nooks for their abodes.

I frequently heard in the neighbourhood of these huts, the "realejo" or organ bird (Cyphorhinus cantans), the most remarkable songster, by far, of the Amazonian forests. When its singular notes strike the

ear for the first time, the impression cannot be resisted that they are produced by a human voice. Some musical boy must be gathering fruit in the thickets, and is singing a few notes to cheer himself. The tones become more fluty and plaintive ; they are now those of a flageolet, and notwithstanding the utter impossibility of the thing, one is for the moment convinced that somebody is playing that instrument. No bird is to be seen, however closely the surrounding trees and bushes may be scanned, and yet the voice seems to come from the thicket close to one's ears. The ending of the song is rather disappointing. It begins with a few very slow and mellow notes, following each other like the commencement of an air ; one listens expecting to hear a complete strain, but an abrupt pause occurs, and then the song breaks down, finishing with a number of clicking unmusical sounds like a piping barrel-organ out of wind and tune. I never heard the bird on the Lower Amazons, and very rarely heard it even at Ega ; it is the only songster which makes an impression on the natives, who sometimes rest their paddles whilst travelling in their small canoes along the shady by-streams, as if struck by the mysterious sounds.

The Tucúna Indians are a tribe resembling much the Shumánas, Passés, Jurís, and Mauhés in their physical appearance and customs. They lead like those tribes a settled agricultural life, each horde obeying a chief of more or less influence, according to his energy and ambition, and possessing its pajé or medicine-man, who fosters its superstitions ; but they are much more

idle and debauched than other Indians belonging to the superior tribes. They are not so warlike and loyal as the Mundurucús, although resembling them in many respects, nor have they the slender figures, dignified mien, and gentle disposition of the Passés; there are, however, no trenchant points of difference to distinguish them from these highest of all the tribes. Both men and women are tattooed, the pattern being sometimes a scroll on each cheek, but generally rows of short straight lines on the face. Most of the older people wear bracelets, anklets and garters of tapir-hide or tough bark; in their homes they wear no other dress except on festival days, when they ornament themselves with feathers or masked cloaks made of the inner bark of a tree. They were very shy when I made my first visits to their habitations in the forest, all scampering off to the thicket when I approached, but on subsequent days they became more familiar, and I found them a harmless, good-natured people.

A great part of the horde living at the first Maloca or village dwell in a common habitation, a large oblong hut built and arranged inside with such a disregard of all symmetry, that it appeared as though constructed by a number of hands each working independently, stretching a rafter or fitting in a piece of thatch, without reference to what his fellow-labourers were doing. The walls as well as the roof are covered with thatch of palm-leaves; each piece consisting of leaflets plaited and attached in a row to a lath many feet in length. Strong upright posts support the roof, hammocks being slung between them, leaving a free space for passage

and for fires in the middle, and on one side is an elevated stage (*girao*) overhead, formed of split palm stems. The Tucúnas excel most of the other tribes in the manufacture of pottery. They make broad-mouthed jars for Tucupí sauce, caysúma or mandioca beer, capable of holding twenty or more gallons, ornamenting them outside with crossed diagonal streaks of various colours. These jars, with cooking-pots, smaller jars for holding water, blow-pipes, quivers, matirí bags* full of small articles, baskets, skins of animals, and so forth, form the principal part of the furniture of their huts both large and small. The dead bodies of their chiefs are interred, the knees doubled up, in large jars under the floors of their huts.

The semi-religious dances and drinking bouts usual amongst the settled tribes of Amazonian Indians are indulged in to greater excess by the Tucúnas than they are by most other tribes. The Juruparí or Demon is the only superior being they have any conception of, and his name is mixed up with all their ceremonies, but it is difficult to ascertain what they consider to be his attributes. He seems to be believed in simply as a mischievous imp, who is at the bottom of all those mishaps of their daily life, the causes of which are not very immediate or obvious to their dull under-

* These bags are formed of remarkably neat twine made of Bromelia fibres elaborately knitted, all in one piece, with sticks ; a belt of the same material, but more closely woven, being attached to the top to suspend them by. They afford good examples of the mechanical ability of these Indians. The Tucúnas also possess the art of skinning and stuffing birds, the handsome kinds of which they sell in great numbers to passing travellers.

standings. It is vain to try to get information out of a Tucúna on this subject; they affect great mystery when the name is mentioned, and give very confused answers to questions: it was clear, however, that the idea of a spirit as a beneficent God or Creator had not entered the minds of these Indians. There is great similarity in all their ceremonies and mummeries, whether the object is a wedding, the celebration of the feast of fruits, the plucking of the hair from the heads of their children, or a holiday got up simply out of a love of dissipation. Some of the tribe on these occasions deck themselves with the bright-coloured feathers of parrots and macaws. The chief wears a head-dress or cap made by fixing the breast-feathers of the Toucan on a web of Bromelia twine, with erect tail plumes of macaws rising from the crown. The cinctures of the arms and legs are also then ornamented with bunches of feathers. Others wear masked dresses: these are long cloaks reaching below the knee and made of the thick whitish-coloured inner bark of a tree, the fibres of which are interlaced in so regular a manner, that the material looks like artificial cloth. The cloak covers the head; two holes are cut out for the eyes, a large round piece of the cloth stretched on a rim of flexible wood is stitched on each side to represent ears, and the features are painted in exaggerated style with yellow, red, and black streaks. The dresses are sewn into the proper shapes with thread made of the inner bark of the Uaissíma tree. Sometimes grotesque head-dresses, representing monkeys' busts or heads of other animals, made by stretching cloth or skin over a basket-

work frame, are worn at these holidays. The biggest and ugliest mask represents the Juruparí. In these festival habiliments the Tucúnas go through their monotonous see-saw and stamping dances accompanied by singing and drumming, and keep up the sport often for three or four days and nights in succession, drinking enormous quantities of caysúma, smoking tobacco, and snuffing paricá powder.

I could not learn that there was any deep symbolical meaning in these masked dances, or that they commemorated any past event in the history of the tribe. Some of them seem vaguely intended as a propitiation of the Juruparí, but the masker who represents the demon sometimes gets drunk along with the rest, and is not treated with any reverence. From all I could make out, these Indians preserve no memory of events going beyond the times of their fathers or grandfathers. Almost every joyful event is made the occasion of a festival: weddings amongst the rest. A young man who wishes to wed a Tucúna girl has to demand her hand of her parents, who arrange the rest of the affair, and fix a day for the marriage ceremony. A wedding which took place in the Christmas week whilst I was at St. Paulo, was kept up with great spirit for three or four days; flagging during the heats of mid-day, but renewing itself with increased vigour every evening. During the whole time the bride, decked out with feather ornaments, was under the charge of the older squaws, whose business seemed to be, sedulously to keep the bridegroom at a safe distance until the end of the dreary period of dancing and boosing. The Tucúnas

have the singular custom, in common with the Collínas and Mauhés, of treating their young girls, on their showing the first signs of womanhood, as if they had committed some crime. They are sent up to the girao under the smoky and filthy roof, and kept there on very meagre diet, sometimes for a whole month. I heard of one poor girl dying under this treatment.

The original territory of the Tucúna tribe embraced the banks of most of the by-streams, from forty miles below St. Paulo to beyond Loreto in Peru, a distance of about 200 miles; the tribe, however, is not well-demarcated from that of the Collínas, who appear to be a section of Tucúnas, and whose home extends 200 miles further to the east. The only other tribe of this neighbourhood concerning which I obtained any information were the Majerónas, whose territory embraces several hundred miles of the western bank of the river Jauarí, an affluent of the Solimoens, 120 miles beyond St. Paulo. These are a fierce, indomitable, and hostile people, like the Aráras of the river Madeira; they are also cannibals. The navigation of the Jauarí is rendered impossible on account of the Majerónas lying in wait on its banks to intercept and murder all travellers, especially whites.

Four months before my arrival at St. Paulo, two young half-castes (nearly white) of the village went to trade on the Jauarí; the Majerónas having shown signs of abating their hostility for a year or two previously. They had not been long gone, when their canoe returned with the news that the two young fellows had been shot with arrows, roasted and eaten by the savages. José Patricio, with his usual activity in the cause of law and

order, despatched a party of armed men of the National Guard to the place to make inquiries, and, if the murder should appear to be unprovoked, to retaliate. When they reached the settlement of the horde who had eaten the two men, it was found evacuated, with the exception of one girl, who had been in the woods when the rest of her people had taken flight, and whom the guards brought with them to St. Paulo. It was gathered from her, and from other Indians on the Jauarí, that the young men had brought their fate on themselves through improper conduct towards the Majeróna women. The girl, on arriving at St. Paulo, was taken care of by Senhor José Patricio, baptised under the name of Maria, and taught Portuguese. I saw a good deal of her, for my friend sent her daily to my house to fill the water-jars, make the fire, and so forth. I also gained her good-will by extracting the grub of an Œstrus fly* from her back, and thus cured her of a painful tumour. She was decidedly the best-humoured and, to all appearance, the kindest-hearted specimen of

* A species of Œstrus or gadfly, on the upper Amazons, fixes on the flesh of man as breeding place for its grub. I extracted five at different times from my own flesh. The first was fixed in the calf of my leg, causing there a suppurating tumour, which, being unaware of the existence of this Œstrus, I thought at first was a common boil. The tumour grew and the pain increased until I became quite lame, and then, on carefully examining the supposed boil, I saw the head of a grub moving in a small hole at its apex. The extraction of the animal was a difficult operation, it being an inch in length and of increasing breadth from head to tail, besides being secured to the flesh of the inside of the tumour by two horny hooks. An old Indian of Ega showed me the most effective way of proceeding, which was to stupefy the grub with strong tobacco juice, causing it to relax its grip in the interior, and then pull it out of the narrow orifice of the tumour by main force.

her race I had yet seen. She was tall, and very stout; in colour much lighter than the ordinary Indian tint, and her ways altogether were more like those of a careless, laughing country wench, such as might be met with any day amongst the labouring class in villages in our own country, than a cannibal. I heard this artless maiden relate, in the coolest manner possible, how she ate a portion of the bodies of the young men whom her tribe had roasted. But what increased greatly the incongruity of this business, the young widow of one of the victims, a neighbour of mine, happened to be present during the narrative, and showed her interest in it by laughing at the broken Portuguese in which the girl related the horrible story.

In the fourth month of my sojourn at St. Paulo I had a serious illness, an attack of the "sizoens," or ague of the country, which, as it left me with shattered health and damped enthusiasm, led to my abandoning the plan I had formed of proceeding to the Peruvian towns of Pebas and Moyobamba, 250 and 600 miles further west, and so completing the examination of the Natural History of the Amazonian plains up to the foot of the Andes. I made a very large collection at St. Paulo, and employed a collector at Tabatinga and on the banks of the Jauarí for several months, so that I acquired a very fair knowledge altogether of the productions of the country bordering the Amazons to the end of the Brazilian territory, a distance of 1900 miles from the Atlantic at the mouth of the Pará; but beyond

the Peruvian boundary I found now I should be unable to go. My ague seemed to be the culmination of a gradual deterioration of health, which had been going on for several years. I had exposed myself too much in the sun, working to the utmost of my strength six days a week, and had suffered much, besides, from bad and insufficient food. The ague did not exist at St. Paulo; but the foul and humid state of the village was, perhaps, sufficient to produce ague in a person much weakened from other causes. The country bordering the shores of the Solimoens is healthy throughout; some endemic diseases certainly exist, but these are not of a fatal nature, and the epidemics which desolated the Lower Amazons from Pará to the Rio Negro, between the years 1850 and 1856, had never reached this favoured land. Ague is known only on the banks of those tributary streams which have dark-coloured water.

I always carried a stock of medicines with me, and a small phial of quinine, which I had bought at Pará in 1851, but never yet had use for, now came in very useful. I took for each dose as much as would lie on the tip of a penknife-blade, mixing it with warm camomile tea. The first few days after my first attack I could not stir, and was delirious during the paroxysms of fever; but the worst being over, I made an effort to rouse myself, knowing that incurable disorders of the liver and spleen follow ague in this country if the feeling of lassitude is too much indulged. So every morning I shouldered my gun or insect-net, and went my usual walk in the forest. The fit of shivering very often seized me before I got home, and I then used to stand

still and brave it out. When the steamer ascended in January, 1858, Lieutenant Nunes was shocked to see me so much shattered, and recommended me strongly to return at once to Ega. I took his advice, and embarked with him, when he touched at St. Paulo on his downward voyage, on the 2nd of February. I still hoped to be able to turn my face westward again, to gather the yet unseen treasures of the marvellous countries lying between Tabatinga and the slopes of the Andes; but although, after a short rest in Ega, the ague left me, my general health remained in a state too weak to justify the undertaking of further journeys. At length I left Ega, on the 3rd of February, 1859, *en route* for England.

I arrived at Pará on the 17th of March, after an absence in the interior of seven years and a half. My old friends, English, American, and Brazilian, scarcely knew me again, but all gave me a very warm welcome, especially Mr. G. R. Brocklehurst (of the firm of R. Singlehurst and Co., the chief foreign merchants, who had been my correspondents), who received me into his house, and treated me with the utmost kindness. I was rather surprised at the warm appreciation shown by many of the principal people of my labours; but, in fact, the interior of the country is still the "sertaõ" (wilderness),—a terra incognita to most residents of the seaport,—and a man who had spent seven and a half years in exploring it solely with scientific aims was somewhat of a curiosity. I found Pará greatly changed and improved. It was no longer the weedy, ruinous, village-looking place that it appeared when I first knew

it in 1848. The population had been increased (to 20,000) by an influx of Portuguese, Madeiran, and German immigrants, and for many years past the provincial government had spent their considerable surplus revenue in beautifying the city.* The streets, formerly unpaved or strewn with loose stones and sand, were now laid with concrete in a most complete manner; all the projecting masonry of the irregularly-built houses had been cleared away, and the buildings made more uniform. Most of the dilapidated houses were replaced by handsome new edifices, having long and elegant balconies fronting the first floors, at an elevation of several feet above the roadway. The large, swampy squares had been drained, weeded, and planted with rows of almond and casuarina trees, so that they were now a great ornament to the city, instead of an eyesore as they

* The revenue of the province of Pará, derived almost wholly from high custom-house duties, had averaged for some years past about £1000,000 sterling. The import duties vary from 18 to 80 per cent. ad valorem; export duties from 5 to 10 per cent., the most productive article being india-rubber.

The total value of exports for 1858 was £355,905 4*s.* 0*d.*, employing 104 vessels of 29,493 total tonnage. More than half the foreign trade was done with Great Britain; the principal nations in order of amount of import trade ranking as follows:—

1. Great Britain.
2. United States.
3. France.
4. Portugal.
5. Hanse Towns.

As most of the articles of consumption are imported and most of those produced exported, the foreign trade of Pará is larger, compared with the internal trade, than it is in most countries. The insignificance of the trade of a country of such vast extent and resources becomes very apparent from the totals here quoted.

formerly were. My old favourite road, the Monguba avenue, had been renovated and joined to many other magnificent rides lined with trees, which in a very few years had grown to a height sufficient to afford agreeable shade; one of these, the Estrada de São José, had been planted with coco-nut palms. Sixty public vehicles, light cabriolets (some of them built in Pará), now plied in the streets, increasing much the animation of the beautified squares, streets, and avenues.

I found also the habits of the people considerably changed. Many of the old religious holidays had declined in importance and given way to secular amusements; social parties, balls, music, billiards, and so forth. There was quite as much pleasure-seeking as formerly, but it was turned in a more rational direction, and the Paraenses seemed now to copy rather the customs of the northern nations of Europe, than those of the mother-country, Portugal. I was glad to see several new booksellers' shops, and also a fine edifice devoted to a reading-room supplied with periodicals, globes, and maps, and a circulating library. There were now many printing-offices, and four daily newspapers. The health of the place had greatly improved since 1850, the year of the yellow fever, and Pará was now considered no longer dangerous to new comers.

So much for the improvements visible in the place, and now for the dark side of the picture. The expenses of living had increased about fourfold, a natural consequence of the demand for labour and for native products of all kinds having augmented in greater ratio than the supply, through large arrivals of non-productive

residents, and considerable importations of money on account of the steamboat company and foreign merchants. Pará, in 1848, was one of the cheapest places of residence on the American continent ; it was now one of the dearest. Imported articles of food, clothing, and furniture were mostly cheaper, although charged with duties varying from 18 to 80 per cent., besides high freights and large profits, than those produced in the neighbourhood. Salt codfish was twopence per pound cheaper than the vile salt pirarucú of the country. Oranges, which could formerly be had almost gratis, were now sold in the streets at the rate of three for a penny ; large bananas were a penny each fruit ; tomatos were from two to three pence each, and all other fruits in this fruit-producing country had advanced in like proportion. Mandioca-meal, the bread of the country, had become so scarce and dear and bad that the poorer classes of natives suffered famine, and all who could afford it were obliged to eat wheaten bread at fourpence to fivepence per pound, made from American flour, 1200 barrels of which were consumed monthly ; this was now, therefore, a very serious item of daily expense to all but the most wealthy. House-rent was most exorbitant ; a miserable little place of two rooms, without fixtures or conveniences of any kind, having simply blank walls, cost at the rate of 18*l.* sterling a year. Lastly, the hire of servants was beyond the means of all persons in moderate circumstances ; a lazy cook or porter could not be had for less than three or four shillings a day, besides his board and what he could steal. It cost me half-a-crown for the hire of a

small boat and one man to disembark from the steamer, a distance of 100 yards.

In rambling over my old ground in the forests of the neighbourhood, I found great changes had taken place—to me, changes for the worse. The mantle of shrubs, bushes, and creeping plants which formerly, when the suburbs were undisturbed by axe or spade, had been left free to arrange itself in rich, full and smooth sheets and masses over the forest borders, had been nearly all cut away, and troops of labourers were still employed cutting ugly muddy roads for carts and cattle, through the once clean and lonely woods. Houses and mills had been erected on the borders of these new roads. The noble forest-trees had been cut down, and their naked, half-burnt stems remained in the midst of ashes, muddy puddles, and heaps of broken branches. I was obliged to hire a negro boy to show me the way to my favourite path near Una, which I have described in the second chapter of this narrative ; the new clearings having quite obliterated the old forest roads. Only a few acres of the glorious forest near Una now remained in their natural state. On the other side of the city near the old road to the rice mills, several scores of woodsmen were employed under Government, in cutting a broad carriage-road through the forest to Maranham, the capital of the neighbouring province, distant 250 miles from Pará, and this had entirely destroyed the solitude of the grand old forest path. In the course of a few years, however, a new growth of creepers will cover the naked tree-trunks on the borders of this new road, and luxuriant shrubs form

a green fringe to the path : it will then become as beautiful a woodland road as the old one was. A naturalist will have, henceforward, to go farther from the city to find the glorious forest scenery which lay so near in 1848, and work much more laboriously than was formerly needed, to make the large collections which Mr. Wallace and I succeeded in doing in the neighbourhood of Pará.

*June* 2, 1859.—At length, on the second of June, I left Pará, probably for ever ; embarking in a North American trading-vessel, the "Frederick Demming," for New York, the United States' route being the quickest as well as the pleasantest way of reaching England. My extensive private collections were divided into three portions and sent by three separate ships, to lessen the risk of loss of the whole. On the evening of the third of June, I took a last view of the glorious forest for which I had so much love, and to explore which I had devoted so many years. The saddest hours I ever recollect to have spent were those of the succeeding night when, the mameluco pilot having left us free of the shoals and out of sight of land though within the mouth of the river at anchor waiting for the wind, I felt that the last link which connected me with the land of so many pleasing recollections was broken. The Paraenses, who are fully aware of the attractiveness of their country, have an alliterative proverb, "Quem vai para (o) Pará para," "He who goes to Pará stops there," and I had often thought I should myself have been added to the list of examples.

The desire, however, of seeing again my parents and enjoying once more the rich pleasures of intellectual society, had succeeded in overcoming the attractions of a region which may be fittingly called a Naturalist's Paradise. During this last night on the Pará river, a crowd of unusual thoughts occupied my mind. Recollections of English climate, scenery, and modes of life came to me with a vividness I had never before experienced, during the eleven years of my absence. Pictures of startling clearness rose up of the gloomy winters, the long grey twilights, murky atmosphere, elongated shadows, chilly springs, and sloppy summers; of factory chimneys and crowds of grimy operatives, rung to work in early morning by factory bells; of union workhouses, confined rooms, artificial cares and slavish conventionalities. To live again amidst these dull scenes I was quitting a country of perpetual summer, where my life had been spent like that of three-fourths of the people in gipsy fashion, on the endless streams or in the boundless forests. I was leaving the equator, where the well-balanced forces of Nature maintained a land-surface and climate that seemed to be typical of mundane order and beauty, to sail towards the North Pole, where lay my home under crepuscular skies somewhere about fifty-two degrees of latitude. It was natural to feel a little dismayed at the prospect of so great a change, but now, after three years of renewed experience of England, I find how incomparably superior is civilised life, where feelings, tastes, and intellect find abundant nourishment, to the spiritual sterility of half-savage existence, even if it were passed in the garden of Eden.

What has struck me powerfully is the immeasurably greater diversity and interest of human character and social conditions in a single civilised nation, than in equatorial South America where three distinct races of man live together. The superiority of the bleak north to tropical regions however is only in their social aspect, for I hold to the opinion that although humanity can reach an advanced state of culture only by battling with the inclemencies of nature in high latitudes, it is under the equator alone that the perfect race of the future will attain to complete fruition of man's beautiful heritage, the earth.

The following day, having no wind, we drifted out of the mouth of the Pará with the current of fresh water that is poured from the mouth of the river, and in twenty-four hours advanced in this way seventy miles on our road. On the 6th of June, when in 7° 55′ N. lat. and 52° 30′ W. long., and therefore about 400 miles from the mouth of the main Amazons, we passed numerous patches of floating grass mingled with tree-trunks and withered foliage. Amongst these masses I espied many fruits of that peculiarly Amazonian tree the Ubussú palm ; and this was the last I saw of the Great River.

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THE END.

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